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Journal of a Trip undertaken to explore the Glaciers of the Kanchunjingah Group in the Sikkim Himalaya, in November 1861.—*By Major* J. L. Sherwill, *Revenue Surveyor.*

The rains had been protracted to a later date than usual. On the 2nd November, 1861, after a week of fair weather, on the morning of one of those balmy days for which, at this season of the year, Darjeeling is so famous, our party, consisting of Dr. B. Simpson, Bengal Army, Captain E. Macpherson, 93rd Highlanders, W. Kemble, Bengal Civil Service, and myself, left "The Bright Spot" with the view, if practicable, of reaching and ascending any one of the perpetually snow-clad spurs of the great Kanchunjingah group of mountains, and examining the glaciers of this hitherto unexplored portion of the great Himalaya range. From Dr. Hooker's published map of Sikkim we were led to hope our object would have been attained by following the course of the Ratong river to its source. Accordingly we decided upon following this route, being strengthened in our resolution, by knowing that Captain W. S. Sherwill, in 1852, had failed in reaching *The Big* Mountain by continuing along the crest of the Singalelah Range, his further progress having been stopped by a deep and precipitous valley.

Leaving Darjeeling at 7.45 A. M. on our hill ponies, we passed the Little Rungeet at 10 A. M. over a good bridge made of bamboos lashed together with slips of cane, forming an arch supporting a pendent roadway which was constructed in one night by Murray's sappers for the late Lady Canning. Reached the frontier outpost of Goke, at

10.30 A. M. It is situated on the summit of a narrow range which separates the Little Rungeet from the Rummàn, which river here forms the boundary between British and Independent Sikkim.

We parted with our ponies at Goke and proceeding on foot in an easterly direction, reached the Rummàn at noon, which river we crossed, not very far from its junction with the Great Rungeet, by a well constructed bridge of bamboos. The luxuriance of the vegetation along the northern slopes of the Goke spur is beyond all description beautiful. Near Goke are groups of stately saul trees, elegantly covered with clusters of ferns—one kind in particular encircles the saul, forming coronet-like bunches one above the other, the broad leaves of the fern resembling the feathers of a shuttlecock. On one tree we counted eleven of these coronets rising one above another. Towards the Rummàn, at a lower elevation, we passed through a grove of gigantic bamboos about a mile in extent. These bamboos are commonly used by the hill people for carrying water. Mica schist exists in considerable quantity along the spur, and the soil is rich and deep. Proceeding onwards and taking a northerly direction, we doubled round the Chakoong hill, and reached the Rut-too at 3 P. M. which we mistook for the Rishee. Crossing the Rut-too by a couple of stout saplings thrown across this wild and very pretty torrent, we commenced the ascent of the Rishee spur of the Hee mountain. Here one of our party became quite knocked up by the long and fatiguing walk, but after despatching the best part of a tin of marmalade, was sufficiently recovered to proceed and mount the remainder of the steep acclivity and descend the other side as far as the Rishee cultivation, where we arrived at 6 P. M. after a harassing march of twenty-seven miles, and encamped at an elevation of about 1000 feet above the bed of the river. We found all our things, which had been sent on ahead two days previously, were up and tent pitched. The road which was marked out last year by the sappers, during the temporary occupation of this part of Sikkim, was in pretty good order. It is called by the natives the lower and level road, to distinguish it from that viâ Siriong and upper Rishee, which has many long ascents and descents.

Early next morning the villagers brought us supplies and oranges from Mixidong, for which we paid. After an early breakfast, left Rishee at 8 A. M. and descended to the Rishee river, which was cross-

ed by a bridge made of saplings; hence we ascended the Rinching-poong hill, the lower part of which is rocky and steep, but the upper portion is less so, and the road a made one and good. Passed a good deal of millet cultivation, and stopped with a view to procure some of the well known beverage made from the millet seed, called "Murwa," but the villagers all ran away. We reached Rinchingpoong about 12.45 P. M. and pitched our tent immediately above the site of the field entrenchment occupied last year by Dr. Campbell and Captain Murray's party of sappers. A few trenches, broken planks, pieces of posts strewed about, and the skull of a Bhootia pierced by a bullet, alone mark the spot, where our countrymen, the year previous, withstood the treacherous attack of twenty times their own number. If this portion of Sikkim should ever become British territory, this hill is deserving of particular attention, as possessing great capabilities for the formation of a winter sanitarium. The southern extremity of the hill is about 7000 feet, but the northern, where the village site exists, is not more than 5,600 feet, and the temperature is much milder than that of Darjeeling. The soil is deep and rich, mica schist entering largely into the composition of the hill. It has several good perennial streams, a large pool of water, and broad terraces on all sides. Carriage roads might easily be constructed. The distance from Darjeeling by the lower road is about thirty-five miles. Wheat, millet, rice, buck wheat, &c., are culivated. Crabb apples, raspberries and cherry trees were observed, the latter in full blossom, whilst most of the other trees were shedding their leaves. The daphne or paper-tree also grows here, likewise oak, magnolia, birch, chesnut, walnut and many other forest trees.

There is a Goompa at this place well worth seeing, the Llama belonging to which died nine months ago.

The Llama's widow and relatives brought us a present of four bamboo tubes of hot "Murwa," and later in the evening eggs, rice, milk and fowls; and in the morning more rice for sale, also eggs, milk and millet seed. Our encampment, which was in the midst of very high wormwood, swarmed with hairy caterpillars, which crawled over our beds and up the sides of the tent, and were very troublesome.

The morning was very fine, and having breakfasted early, we were ready for a start, but delayed on account of the coolies who had no rice till this morning's supply arrived.

Left Rinchingpoong at 9 A. M.; passed Soomtong at 9.30; and after two hours of steep descent reached the broad and rapid stream of the Kullait, close to where the Rongsong stream falls into it. Here we had a refreshing bathe and washed clothes. The Kullait is here divided into two streams. The first and smaller was crossed by a slender bridge made of bamboos, having a pendent roadway formed of a single bamboo. Across the second the fishermen have constructed a very ingenious weir of bamboos tied together with cane. During the night, when the fish descend the rapids, they are driven by the force of the water on to an open frame-work of bamboos where they are easily captured. The fishermen cooked some fish by baking or stewing them in a bamboo, a device which succeeded admirably and occupied only a few minutes. We boiled water and made murwa; and having scrambled across the second stream by the aid of the fisherman's weir, by 1 P. M. were wending our way up the very steep Pemionchee hill on the north side of the valley, and at 3.45 P. M. reached Gazing, and the coolies an hour later. We put up in the house of a villager, and were shortly afterwards treated to murwa and plantains by a sturdy Llama with a peculiar drooping eyelid. All our beds were placed in a row, and dinner was served up on an extempore table formed of a plank taken from the flooring. In front was a flaring fire, surrounded by a dozen people of all ages and both sexes, principally the members of our host's family, besides some of our own coolies, including the cook and his deputy. All the members of the family had their heads shaved on account of the recent death of an old servant. After dinner we had singing, but it was not without some difficulty that we persuaded the Bhooteas to favour us. The Llama, who was in grief, sat apart in one corner of the spacious apartment constantly mumbling his prayers, but after partaking of two cups of tea and a cheroot, he was induced to join the social party round the fire. A Dowager Llama was very seriously engaged in her devotions with a praying cylinder the whole time. On breaking up festivities we went to bed, exposed to the gaze of all the fair inmates, who after seeing us comfortably settled for the night modestly retired. But I may as well mention that we had by this time relinquished the vulgar fashion of undressing before retiring to rest. Our slumbers were frequently disturbed by the barking of dogs, squeaking of pigs, and squalling of children. The latter we found in the

morning were without clothing, which may account for their restlessness.

Breakfast over, and after attempting to eat some hard cakes made of crushed Indian corn, cemented with some farinaceous matter, we left for Pemionchee at 8 A. M.; and after a steep ascent reached the Rajah of Sikkim's unfinished durbar at 9 A. M. This durbar was only begun last year, and during the troubles in Sikkim remained untouched, and is now in abeyance until the Pemionchee Monastery is renovated. At present only two stories have been built. As far as it goes, it is a very substantially constructed mansion, 36 × 46 feet. The walls are 5 feet in thickness and of solid masonry, and the floor of the upper story is supported on massive beams and upright posts. It will be a fine building, when completed.

A further steep ascent of half an hour brought us to the Goompa at Pemionchee. This once extensive monastery is now a mass of ruins. It was accidentally burnt in October last year. The full complement of Llamas is 108. Of this number only twelve were present. The remainder were absent in all parts of the country, collecting money and materials for the rebuilding of their temple. Some of the latter, such as pigments and brushes for the painting of the figures of their gods and embellishment of the walls, are to come from China, the artists from Thibet, and other materials from Calcutta. We saw the villagers bringing in half wrought logs of wood from the surrounding forests.

It will take two years to rebuild, and probably as many more to embellish. The Llamas are very anxious to get it completed, as in its present state their occupation is gone. They complained that nobody visited them, a state of things very detrimental to their finances. Formerly they received a subsidy of Rs. 3000 annually from the Rajah of Sikkim, but since the Terai lands and the Darjeeling hills were annexed to British territory, this bounty has been discontinued. The Llamas are consequently poor, but like the monks of old are a fat and jovial race, their sleek faces indicating any thing but a poor larder. We put up in a house belonging to one of the absent Llamas. The head Llama, who is a perfect type of his holy order, treated us to murwa which was very refreshing. He and several other Llamas were sociable and talkative. They informed us that they had two days previously received instructions from the Dewan

at Darjeeling to lay in a supply of rice for us, but had not been able to do so, as very little rice had been cultivated, in consequence of the flight across the Rungeet of the majority of the cultivators during the recent disturbances. They could only supply one maund of rice, and three or four of Indian corn. But I soon found out that this was not the case, and that plenty of rice was forthcoming on making money advances for it, which I accordingly did, and had it sent after us, some as far as Jongli, and some placed in Caches at intermediate stations.

From Pemionchee, which is 7000 feet high, a fine view of the snow is obtained, also of the valley of the Ratong. The monastery of Chanacheeling is perched upon a high peak of the Pemionchee range to the westward, and at present is made the repository of all the books and other relics saved when the Pemionchee Goompa was burnt. Sinchul and Darjeeling are visible over the Kulloo Mendong twenty miles in direct distance.

This morning the weather was again very fine; the thermometer at sunrise stood 48°. Dr. Simpson photographed the snow, the Goompa and one of the Llama's houses. Left Pemionchee at 8.45 A. M.; and after a steep descent and rapid walk of 45 minutes reached the village of Chonpoong, consisting of about fifteen well built houses very pleasantly situated at the foot of a tree forest, on a rather flat terrace on a spur of the Pemionchee hill. It commands good views on three sides to the north. Eksum is seen in the foreground, looking very flat and having a quantity of cultivation round it. The deep and thickly wooded valley of the Ratong is conspicuous winding to the west, across which are plainly visible the fine waterfalls of Lemgong, dashing headlong down perpendicular walls of gneiss rock, over which a near view of the Nursing and Junnoo mountains is obtained, but Kanchungingah is depressed behind the Baraborony hill. To the east a high mountain in Sikkim is striking, and the monasteries of Raking and Tassiding, the latter perched upon a conical hill standing apart from all others. To the west, the distant view of the Singaleelah range, seen across the valley of the Ringbi, is very grand. Altogether the view from Chonpoong is striking and beautiful, but that of the snow is limited, and far less grand than that obtained from Darjeeling.

It was our intention to proceed direct to Eksum, which is the shortest road by several miles; but understanding from the villagers

that the bridges across the Ringbi and Ratong were broken, we were compelled to proceed by the long route viâ Tingling. So after partaking of murwa presented to us by the mundul or headman, and having made purchases of rice, fowls, eggs and butter, at 10.30 A. M. we resumed our march in a westerly direction. Having crossed through the Liebong cultivation and clearance, and making a rapid and very steep descent, we crossed the Ringbi by a bamboo bridge thrown across a deep narrow gorge, through which the whole body of the stream rushed with impetuosity, rolling and boiling over large blocks of gneiss rock. The Ringbi at this spot is very narrow, confined between steep rocky sides, the bed of which is full of deep pools of clear water. The ridge was not more than twenty feet in length, and the view of the river from it very wild. After a steep ascent and a slight descent we reached the Ringbi, here we bathed, washed clothes and had tiffin. Air 70° ; water 56°.

Left the river at ¼ to 2 P. M. and after a steep ascent of 40 minutes reached our halting-place at Tingling, altogether a distance of about eight miles. We put up in the house of the headman of the village, who very politely offered us his apartment on the floor of which our dinner was cooked. We turned in early, but what with the coughing and loud talking of our host's family, some of us did not get to sleep until near morning. There was an ill-natured cur at this place, who several times snarled and snapped at our heels.

We had not been in bed very long before a rumbling noise, not unlike the devotional murmurings of a Llama, was heard, which shortly increased in earnestness and became louder and louder. At last it was indistinctly heard to say, "that beast of a dog has got hold of my hand and won't let go, he has bitten my hand right through now ;" and then the same voice was very distinctly heard to say, "I'll eat no more dinner, I was in a mortal funk, and could get no one to take the beast off, though I tried hard to do so." This was our friend Kemble who had evidently partaken freely of dinner, and was labouring under the effects of nightmare.

The Molee Goompa is immediately above Tingling on the summit of the Molee mountain. The Chanacheeling, Pemionchee, Tassiding, Rubolong, Gyratong, Doobdee and Kaichoopeenee Goompas are all visible from this place.

After having purchased some fowls and partaken of an early breakfast, we started at 8.30 A. M. and after fifteen minutes' steep descent passed the small village of Kasuppyah, consisting of two houses and some clearance for cultivation. The headman was waiting for us with presents of sugar-cane, murwa, eggs, plantains and milk.

Another quarter of an hour of steep descent brought us to Linchoogong, a small village of three houses. At 9.30, after a very steep, stony and difficult descent, we arrived at the Ratong, which is here a wild, foaming and boiling torrent, dashing over large blocks of gneiss rock. We halted till 11.30 bathed and washed clothes. The temperature of the water was 48°.

Dr. Simpson took two photographs of this wild spot, which unfortunately were afterwards destroyed. We crossed the torrent by a temporary bridge constructed by the inhabitants of the village of Labeeong, who also brought us presents of rice, murwa and eggs. After a steep scramble of a quarter of an hour, we met the inhabitants of the village of Paranting, who brought us hot murwa, and had prepared a place to sit down. They were particularly polite; the women were highly decorated with coral, amber and silver ornaments; both sexes wore flowers of a pretty blue hydraugea in their ears. Three of the women had jackets made of European long-cloth, dyed blue, but the children, as usual, were quite naked. After a further steep ascent we reached our halting-place at Eksum at 1 P. M. This is the frontier village, prettily situated on a broad plateau surrounded by high commanding mountains, most of which have their summits capped with fir trees, and their slopes richly clothed with deep verdure and stately forest trees. A few hundred feet above the village, to the east, the monastery of Doobdee is seen perched on the summit and at the extremity of a separate spur, in a very picturesque position. It is probably of very ancient origin, built by the first Buddhist priests who settled in Sikkim. Eksum derives its name from Ek or Yeuk which means a "labourer" or "workman," and "soom" three, from the first three Bhuddhist ministers who came into Sikkim from Thibet, having commenced their spiritual labours at this place.

We put up for the night in the house of a villager, the female members of which, on their return from the toils of the field, seemed not at all pleased at finding their house in the possession of strang-

ers, however, they soon became reconciled and appeared to take considerable interest in our culinary operations.

Our host had been a cripple for twenty-two years from the effects of a hatchet cut, but this did not deter him from soliciting medicine to cure him. The females all left before we turned in for the night, but mine host remained and drank whiskey toddy which made him very restless all night. We had most of us become very bad sleepers, and very little disturbed us, so what with mine host passing in and out and the fighting and incessant squeaking of young pigs under the floor, we got very little sleep.

As this is the last village towards the snow, the coolies wanted a halt which was not conceded. Before starting we purchased three maunds of rice, four fowls and some eggs, and distributed some glass beads and buttons amongst the members of our host's family, and presented a metallic snuff box to the Doobdee Llama, from whom we bought a yàk for 12 Rupees. We left Eksum at 9.30. The first part of the road was good, but it soon became very bad. It lay along the side of an almost precipitous hill, where a false step would often have precipitated the traveller many feet headlong down the kudd towards the Ratong, the roaring of whose waters below was very audible. At 11 A. M., we passed the beautiful water-falls of Barabarong, dashing headlong down a precipice over immense blocks of gneiss in situ. The water was clear as crystal.

The ascent on the opposite side was very difficult: we were sometimes obliged to scramble upon all fours, at others to mount by steps cut in upright posts, or along saplings slung over precipitous parts. In a few places the yak herdsmen have cut foot-steps in the solid rock for the convenience of travellers, who would often find it difficult to proceed without such assistance. The hills are very precipitous, as is the case in all the back ranges near the snow in Sikkim. The range on which we were, was thickly covered with forest trees and underwood, it was only occasionally we obtained a peep at the noble capped mountain across the Ratong. We encamped in a very jungly place in the midst of forest, at a spot called Joaboo, near a small mountain torrent. We wished to go on a little further to Neebee, but were prevented, for want of water at that place. Although the whole distance was not more than seven miles, the march was a fatiguing one for the baggage coolies who arrived late in the evening. We all

assisted in cooking dinner. Cooking has become quite a pastime with us. We are now at an elevation for that troublesome and loathsome parasite, the Himalaya tick, which we have found rather abundant.

Started at 8.46; and after going over five or six miles of difficult road, reached the Ratong which is here the same foaming, boiling torrent. We crossed immediately above a water-fall, over three very primitive constructions which served for bridges. The bed of the river at this spot has an elevation of 7,790 feet, and we found the temperature of the water to be 42°, too cold for bathing. After a very steep and fatiguing ascent of four or five miles, we reached our halting-place at Chockachaine at ¼ before 2 P. M. There is a pool of indifferent water here, and a hut erected by the yàk herdsmen who often reside here during winter. The height of the encampment, as ascertained by boiling water, was 10,300 feet. The hill sides were perfectly covered with forest trees and tangled underwood, the same as yesterday. As we ascended, the changes in the flora were very remarkable. We were now in the region of rhododendrons, of which we observed several kinds; also of oaks, whose acorns were scattered along our path in great profusion, holly; walnut, chesnut, long and short-leafed scarlet barberry; many beautiful varieties of ferns; mosses pendent from trees, besides other kinds, including the stag moss so well known at Darjeeling; creepers of all kinds and sizes, epiphytical and parasitical plants of various kinds; and towards the end of our day's journey we were well amongst tall firs. We saw a few leeches, but found the ticks most abundant and voracious.

Thermometer at sunrise 28°, but not so cold to the feeling. We ascertained that all the yàks had left Jongli and were in the vicinity of Chockachaine. We sent a man to drive the yàks to our camp for inspection, but we quitted before his return. Left at 8 o'clock and after a steep ascent reached Mon Lepcha at 11.15 A. M. and Jongli at 1 P. M. From Mon Lepcha the road is easy, but we found the first part of the road very trying, all of us suffering more or less from shortness of breath and headache. There are no huts at Mon Lepcha: it is the name given to the locality, which is a feeding ground for yaks at an elevation of about 14,000 feet. Dr. Simpson took some photographic views of the snow which is very imposing from the spot. Between this and Jongli we passed several frozen rivulets.

Jongli is the name given to an extensive tract of yàk pasture land, situated at the foot of Gubroo, on the southernmost spur of that mountain, including all the land to the south of Gubroo, contained between the Ratong and Chuckchurong rivers, of which Mon Lepcha is an integral part. The elevation of the pasture land averages from 12,000 to 16,000 feet, the latter being the greatest height at which yàks are grazed during the summer months. The spur is broad and undulating like a swelling table-land devoid of forest. It is richly covered with good grass, intermixed with a low and scrubby rhododendron and the dwarf and an aromatic kind. It is the grazing ground of about eighty yàks belonging to parties in Nepal and Sikkim, and is capable of affording pasturage to many hundreds more. The yàk herdsmen have erected three substantial huts of stone with shingle roofs. They reside at Jongli during the summer and rains, but when the cold sets in in November, they descend to winter quarters in lower and warmer elevations. The entire pasture ground is well watered by numerous perennial streams, most of which were frozen up at night during our stay at Jongli. It is situated above the region of tree rhododendrons and firs. During our ascent we passed through all the flora met with at Sinchul and Tonglo. At 12,000 feet we lost the ferns. Having passed through firs, birch, rhododendrons, junipers and a kind of heather, dwarf and aromatic rhododendrons, barberry, primrose, &c., we entered the undulating and grassy flats of Jongli. On the road, not far from our last halting place, we met a wild looking man of the woods, whom our servants introduced to us as the Llama of Jongli. He stated himself to be eighty years of age. He looked more like a Gorilla than a human being. A more comical weather-beaten and hale old gentleman I have never seen. He had a very hoarse voice and a large goitre to boot. He had just left Jongli for his winter quarters, which he had taken up under an over-hanging piece of gneiss rock in a fir forest.

After tiffin at 2.30 P. M., MacPherson and I set off for the summit of what we considered to be the highest of the Jongli mountains. After two hours of very fatiguing climbing and suffering from shortness of breath, headache and nausea, we reached the top and found it to be 15,120 feet.* Thick clouds setting in, we were disap-

* This hill affords capital pasture for the yàks, being covered with good grass and juniper bushes. The latter all assume the same inclination as the slope

pointed in the principal object of our trip, which was to endeavour to trace a practicable route by which to reach the snow peaks in that direction. The surrounding hills were totally obscured, and in commencing our descent, the guide wanted to take us down the wrong side of the hill; but preferring to trust to our compass we were not misled.

With splitting headache and quite knocked up, we reached our hut at 5 P. M.

The night was very cold, but being well provided with warm clothing, we were all right; but the coolies, although well-housed, suffered a good deal.

The thermometer at sunrise stood at 18°. The small streams were all frozen. At this early hour the snow appeared so close that it seemed to tower above us. The sky was cloudless and the cold very keen. After breakfast we went on a reconnoitring expedition to the summit of Thonja, a hill immediately to our front, at the foot of Gubroo, in the direction of Kanchunjingah. It is a fine grassy mountain affording excellent pasturage, about 14,500 feet high. Dr. Simpson took some beautiful photographs of this wild region.

When on the crest of the hill, which is precipitous to the north side, we witnessed a very beautiful and perfect sun bow. It was seen in a mist a few feet down the precipice and remained visible for a long time. We reached our hut at 2 P. M., some of us feeling very queer from the rarified state of the atmosphere, having headache and nausea. On our return we flushed two covies of birds at from 12,000 to 13,000 feet, closely resembling Ptamagan, probably the "*Tetragallus Himalayensis*" of which I have since seen some specimens in the Society's Museum. I shot one with a bullet which immediately concealed itself under the rocks, and occupied us a long time getting it out. In the evening the men who had been sent down in the morning to bring up the yàk purchased from the Doobdee Llama returned, bringing a fine black animal with an uncommonly bushy tail, about the size of a Highland bull.

The morning was very fine, but the night had been intensely cold. Shortly after sunrise the thermometer stood at 17°. The first object

of the hill side caused apparently by the strong blasts of wind which constantly blow up the hill.

that attracted my attention was our black friend the yàk, who had turned white during the night, his long shaggy flanks being entirely covered with a coating of ice.

After taking an early cup of cocoa, some of the party started on another exploring expedition.

After proceeding about three miles, sometimes along yak tracks, and at others along the grassy slopes of the mountains and over dwarf rhododendron, we found ourselves on the verge of a deep precipice which entirely cut us off from a snow spur which we desired to reach on the other side of the gorge. It would have taken us hours to reach the bottom of this valley and the remainder of the day to ascend the opposite side; so we relinquished the object we had in view at starting, and decided upon ascending the perpetual snow clad peak of Gubroo instead. After partaking of breakfast near the Gubroo lake, a fine clear and deep sheet of water 130 paces square, situated in a picturesque spot at the foot of the mountain to the south-east, we commenced the ascent of Gubroo which we found very trying from its steepness, and the great elevation causing shortness of breath, nausea, and violent headache. We reached about 16,500 feet, when I found it impossible to proceed any further, in consequence of an oppression in the head and a feeling like that of seasickness. The Gubroo range, as seen from Darjeeling, presents a black, rocky and precipitous foreground to Kanchunjingah. It is formed of a finely laminated dark colored gneiss and hornblende, which exist in immense angular masses, rising in steps with perpendicular walls. The snow lies very thick on the summit of these flat masses and in the cavities, though scarcely visible at a distance.

The snow was very bright and dazzling; our attendants being unable to stand the glare and cold, remained behind. We commenced the descent at 1 P. M., and reached camp at 3.30 P. M. The droppings of deer were everywhere visible, but we only sighted one musk deer which rose close to us in scrubby rhododendron forest. A fine covey of Tetragallus and two solitary snipes were also seen, but we were disappointed at the absence of game along the eastern slopes of the Jongli plateau which is well watered by numerous small streams, some of which spreading out with marshes and small lakes afford excellent cover for pheasants and jungle fowl. During our absence our headman had shot the yàk and prepared a savoury

stew of yàk's heart and kidneys which we discussed with a hunter's keen appetite.

Another superb morning: the night was intensely cold, and the thermometer a little after sunrise stood at 11½°. Having made all the necessary arrangements for an absence of four days, and leaving all heavy baggage behind, at 10.30 A. M. we started for a place situated near the base of the Pundeem mountain, on the left bank of the Ratong river, several miles further up the valley, called Aluhtong, where there is a yàk-grazing post. After proceeding about three miles along yàk tracks over grass and low rhododendrons, we commenced a steep descent through rhododendron forest, and afterwards through firs, and reached the banks of the Ratong about noon. The river here is broad and rapid, but as we ascended the valley, it became less rapid and of smaller dimensions. It was not without difficulty that we found our way along the broad valley, over masses of loose stone and broken ground, by following the course indicated by small piles of stones erected by the yak herdsmen. We increased the number and size of these useful guides for the benefit of our friends in the rear, and after two or three times losing our way, reached our destination at 2.30 P. M., and some of the party an hour later; and the baggage coolies late in the evening, looking half frozen. We brought on a tent for the latter; and before turning into our own hovel, we satisfied ourselves that these were well supplied with fuel, yàk's flesh, and rice for their evening's repast. The grandeur of the surrounding snow-clad mountains, and the wildness of the scenery of the valley of the Ratong, surpasses any thing of the kind I have elsewhere witnessed in the Himalayas. On looking directly north up the valley, Kanchunjingah rose majestically above everything else. Between us and it, thrown completely across the valley, and only two miles distant, was seen a stupendous morain a thousand feet in height, which forms the conspicuous object seen from Darjeeling. Immediately on our right, out of a long range of perpetually snow-clad mountains running parallel with the valley, rose the formidable peak of Pundeem, 22,015 feet in height, at the base of which rests the glacier above alluded to, and many other masses of debris washed down from above in wild confusion. To our rear, winding its course down the broad valley, the hills on either side being covered with dense fir forest often down to

the water's edge, was seen the noisy, foaming Ratong. On our left a dark range of bare, bold and craggy mountains 16,000 or 17,000 feet high, capped with snow, having the appearance of basaltic formation, but formed of gneiss mixed with hornblende and syenite, rose abruptly. We were the first European travellers to gaze upon this truly grand scene. Any one desirous of witnessing grandeur of scenery should visit Alutong. However toilsome and comparatively uninteresting he may find the intermediate travelling as far as Jongli, he will be well repaid by the wild scenery of this locality.

Another cold night, and clear, crisp morning; thermometer at sunrise $5\frac{1}{2}^{o}$; and at sunset, the valley having been in the shade since 4 P. M., it stood at 21°. At 10 o'clock we all started to explore the morains. We proceeded at times along the bed and banks of the river, at others over rough, stony ground, deeply intersected by small running streams coming from the snow. The main stream flows gently over a gravel bed of moderate incline. The valley is nearly a mile broad, and covered with dwarf rhododendron and grass wherever soil occurs.

A little before reaching the morain we passed a series of Mendongs, having numerous slabs of well carved prayers and images of the gods in the side walls, extending the entire length. These slabs of chlorite slate are carved by Llamas from the Sikkim monasteries who periodically visit this place on pilgrimage during the rains.

Having ascended the immense mass of debris forming the morain, probably to an elevation of 15,000 feet, we found ourselves, to our great surprise, standing on the top of a stupendous glacier. This huge mass of ice and debris descending from the Pundeem mountain extends nearly across the valley, where it is met by, and abuts upon another glacier, equally vast in its dimensions, and formed at the base of the snow-clad mountains on the other, or western side of the valley, the two together forming a complete barrier across the valley and choking it up to the height of a thousand feet or more. The morain forms the retaining wall to this mass of moving ice and debris, and is composed of rounded and angular blocks of *highly contorted gneiss*, intermixed with pieces of syenite, micaceous schist, coarse granite, quartz with tourmaline crystals, white and pink quartz, often containing veins of crystalized felspar and coarse gravel and debris. Towards the summit the fragments were all

angular, and free from gravel. The loose manner in which these were massed together, rendered walking both difficult and dangerous, particularly to parties in the rear, from the tendency of the stones to roll down the steep sides. Proceeding onwards, the glacier presented a perfect wilderness of blocks of ice invariably covered with the stones and debris brought down from the mountain above by avalanches, with deep crevasses through which the sound of running water was heard, the whole presenting a stony and undulating mass about one and a half miles long and a half to one quarter of a mile broad. In order to ascertain as nearly as possible what might be the thickness of the glacier, we ascended by a separate spur of Pundeem to a level with the top of the glacier, and measuring the height by boiling water found it to be 16,060 feet, and again measuring the height at the foot found it 13,760 feet, thus giving a difference between the summit and the base of 2,300 feet. I was able to make a rapid sketch of a vertical section of a precipice on the western shoulder of Pundeem, shewing its formation to be of gneiss, similar to that found on the glacier of which I brought away some good specimens. Although the surrounding hills were literally covered with glaciers of sizes, and the valleys overhung with masses of ice and snow, we observed only one avalanche, but frequent loud cracking of the ice during the hottest part of the day.

A little way up the valley, beyond where the glaciers meet, we observed a small lake. Only one small stream falls into it, and this must be considered the source of the Ratong during the winter months. Dr. Simpson here took some interesting photographic views. We returned to our hut late in the evening. To-day our Lepcha cook whom we brought from Darjeeling failing to give satisfaction was removed from office. Thus the cooking operations devolved upon ourselves; but this was not felt to be irksome, as we had from the beginning taken turn about to look after the messing for the day, knead the flour for making chupattees, or unleavened cakes, assist in cooking, &c., our ci-devant cook knowing nothing of the mysteries of his profession beyond lighting a fire, boiling water, washing plates and so forth. In fact he was an impostor.

Another cloudless morning after an intensely cold night. Thermometer at sunrise 11°. The coolies having laid in a good store of wood over night, next day we were enabled to cook an early breakfast,

and resume our explorations in the direction of Kanchunjingah. Mounting over the two glaciers of yesterday, and proceeding by the lake, which we found to be about 500 yards long by 100 broad, we ascended another immense morain which confined a third glacier on the west side of the valley. This one appeared to begin nearly on a level with the top of the mountain range, at probably 20,000 feet, then descending by the mountain side came sweeping along the valley in a curve about a mile in length, the more elevated portion being formed of masses of ice covered with snow, rising in steppes one above the other, and the lower portion presenting a sea of broken masses of ice, covered with snow and debris. A more stupendous mass of ice and snow it is scarcely possible to conceive. Dr. S. took a photograph of it. On our right at the foot of Pundeem we saw another lake partially frozen, and a little further on a third one. Descending from the glacier we proceeded for a mile, occasionally along the dry, smooth bed of the Ratong, and over frozen snow, when we arrived at the fourth and last glacier, equal in extent to the others. With great difficulty we scrambled up the steep sides of its retaining morain, over frozen snow. When near to top, Kemble was nearly precipitated to the bottom by his foot giving way and only saved by rapidly digging his alpine stick into the snow, which pulled him up.

On reaching the northern extremity of this glacier, at the head of the Ratong valley, we found ourselves standing on the water shed between Kanchunjingah, and the Pundeem, Kubra, and Junnoo ranges to the south and west. We were at an elevation of about 18,500 feet, and had we proceeded further, we should have had to descend into what appeared to us a perpetually snow covered valley. Although we were unable to look down into the bottom of the valley, we could see the clouds rise out of it from the east and west and ascend the sides of Kanchunjingah, of which we obtained a near and good view through a narrow gorge which terminates the Ratong valley. Kanchunjingah stood apart, unconnected with any of the high mountain ranges to the south. The nearest spot not covered with snow in its southernmost spur was probably not more than a mile and a half or two miles distant, the stratification of which was clearly visible. Its formation is probably of gneiss, not of a contorted type, and which has a dip of 20 to 25° to the east. Others may determine the interesting point of its geological structure, but this

important fact was elicited, namely, that Kanchunjingah is detached from the other mountains forming the Kanchunjingah group, and that none of its waters find their way into the Great Rungeet, either by the Ratong or any other tributary.

Our half frozen coolies, unable to proceed so far over the snow, dropped to the rear unobserved by us, but we picked them up on our return, and Dr. S. managed to get three good photographs, one of which was "Pundeem *from the north*." It being too late in the day to attempt any further exploration, we commenced our return at 2 P. M., and after several stoppages and very brisk walking we reached Aluhtong by moonlight, at about 6.45 P. M., having undergone a very laborious and fatiguing day's work, during nine and a half hours. We found a Bhooteah lad had prepared us some yàk soup and chupattees which we fell upon with ravenous appetites.

We all rose with heated and sore eyes, and scorched faces, the effects of the cold wind, the sun and the glare from off the snow. Thermometer at sunrise 11°. At 9.30 A. M. we quitted our hut and very reluctantly turned our backs upon the wild scenery of the upper Ratong and our faces homewards. Arrived at Jongli at 2.30, but not so our coolies, who had suffered so much from the cold at night, and from the cold blasts of wind during the day, which incessantly blew up the valley during our stay at Aluhtong. We retraced our steps, guided by the heaps of stones, and after going about four miles commenced to ascend by the steep pathway through the firs and rhododendrons. The road was rendered very difficult and slippery by the recent fall of dead leaves. Passing under Gubroo, and near the lake, we reached our old quarters at Jongli at 2.30 P. M., and the coolies two hours later.

Rose early, packed up for a start homewards. Left our homestead at Jongli at 8.30 A. M. with twenty-four coolies, four of whom carried guns, four bedding, two minerals, two photographic apparatus, one the tent, ten stores, cooking utensils, &c., and two were sick. The coolies were badly clothed, some had sore legs and chapped hands and feet, and all looked more than half frozen and incapable of carrying loads at this early hour of the morning, but not a murmur escaped them; they left with heavy loads, but light hearts, our cook boy remaining a few minutes behind to blow a parting blast upon a horn or Llama's thigh bone, or some such harmonious instrument. We had

seen Jongli to disadvantage clothed in its autumnal garb, and totally deserted, being too cold and bleak at this season of the year for a residence ; but in the spring and summer months it is no doubt a bright and cheerful spot. During our descent through the firs, we saw our Gorilla Llama engaged in cutting timber near his winter dwelling, and we turned aside to salute him. The largest fir met with by the road side measured 21 feet in girth, and may have been 80 or 90 feet high. Reached Chuckachaine at 1 P. M. and found a small herd of twelve yàk bulls, cows and calves, on the feeding ground at this place. Their colours were black, black and white, and slate coloured. We purchased yàk milk, and drank it mixed with brandy. After half an hour's rest we resumed our march, and descending very rapidly, re-crossed the foaming Ratong by the three crazy bridges, and arrived at Jongoo 2.30 P. M., a distance of about fifteen miles. During the short interval since our upward passage the dead leaves of the rhododendrons and other forest trees had fallen in such abundance as to render the steep descent very slippery and difficult. Having descended nearly 5000 feet, we found the change in the atmosphere most agreeable. and the ticks as numerous and loathsome as before. Mon Lepcha spur is composed of fine gneiss, intermixed with beautiful white quartz and mica schist. From Mon Lepcha I made a series of magnetic observations to fixed points, which enabled me to fix its exact position.

Left Jongoo at 8.30 A. M. and after an hour's brisk walk crossed the Barabarong by a very frail bridge formed by throwing a sapling across the main stream between two large boulders. The bed is full of large angular blocks of gneiss, the same as exists in situ. When within a mile of Eksum, we met Mr. Long and Lieut. Bartley, of the Queen's Bays, proceeding to Jongli on a similar visit. They were scarcely prepared for the extreme cold they were about to encounter. We assisted them with some spare rice and clothing. We have since heard that they experienced very severe weather and were compelled to return. Reached Eksum at noon and proceeded to the house of our former host, who at our request made us baked cakes of the flour of millet seed and buck wheat mixed. The flour is quite white, but harsh to the touch. The cake is baked on a heated slab of stone, and when cooked becomes quite black, but is not disagreeable to the taste. It must, however, became very unsavoury when eaten as the sole

article of food, as is the practice with the hospitable inhabitants of this wild and sequestered spot. After purchasing fowls, murwa, eggs and milk, and presenting the members of the family with some articles of warm clothing, we resumed our journey at 2.30 P. M., much against the wishes of our coolies, some of whose families reside here, and all of whom wanted to remain for the night. After a long descent along the Eksum stream, at 3.30 P. M. we passed the Parmarong stream a little below the water-falls, where some of the party had a refreshing bathe in its crystal-like waters amidst blocks of beautifully stratified gneiss. Continuing our course without either much ascent or descent, at 4.30 P. M. we reached Ribbing or Bootong, a small clearance consisting of one Limboo and one Lepcha family, the members of which appeared very poor and destitute of clothing. We put up in the hut of the former, and our Bhooteea cook boy professed not to understand a word of their language, and made signs for any thing he required.

Thermometer at 7 A. M. 50 . Left Ribbing at 9.30, and after a steep and rugged descent reached the Ratong and crossed by an old bridge constructed of bamboos and trees, which had just been repaired for our use ; about a mile further on, we crossed the Ringbi by a very dilapidated suspension bridge made of bamboos. The jungle creepers forming the suspenders of the roadway were all rotten, and the whole fabric bore the appearance of great insecurity. The scenery here and also at the Ratong is very wild and picturesque, and it was matter of regret that " our artist" was not prepared for taking photographs. Observed mica schist in large quantities in situ, and in the beds of both the rivers. From the Ringbi we made a steep ascent to Chongpoong, passing through tree forest and ferns. Our Chongpoong friends did not come out to meet us on this occasion, so we sent to the headman, and purchased some murwa, fowls and eggs, and after an hour's rest started again at 1 P. M., and passing through the umbrageous tree forest below Pemionchee, we reached the Goompa at 2.10 P. M.

The Llamas were not so civil as on our first visit, and on this occasion the head Llama did not make his appearance. On being questioned as to our despatches and stores, they informed us that none had arrived from Darjeeling. This we knew to be false. On closely questioning one of them, he indicated the place where I could find

them. Dr. S. had inadvertently left behind a portion of his photographic apparatus, this had been picked up by one of the monks who declined to restore it, unless he received a remuneration of 2 Rs. Under the circumstances this demand was refused, and the man of holy orders peremptorily ordered to give it up, which he did, and never shewed his face again. This avariciousness was probably caused by seeing us pay liberally for every thing we required, a policy we strictly adopted from the commencement, and which secured us a ready and ample supply of every thing. The prices paid were—rice 12 seers per rupee, fowls 8 annas each, milk 4 annas per bottle, eggs 2 for an anna.

Pemionchee is about 7000 feet high. The thermometer at sunrise stood at 45°. The weather was close and cloudy. Left at 9.30 A. M. and after a very rapid descent passed Gazing at 10.15, stopping a short time to photograph "the Great Mendong" at that place. Reached the Kullait river at noon. After a long, rapid and fatiguing descent, we found the villagers and fishermen had erected a substantial bridge of bamboos about a mile below the weir since our former visit. Here we enjoyed a refreshing bathe in the clear cold waters of the Kullait, and washed clothes, and at 1 P. M. continued our journey up the northern spur of the Rinchingpoong hill, which has a much milder gradient than we had been accustomed to for some time past. At 2.15. halted for a quarter of an hour for luncheon at Soomtong, and reached Rinchingpoong at 4 P. M.; but the coolies did not arrive until after dark, the march being fifteen or sixteen miles, and very fatiguing—the descent from Pemionchee to the Kullait being not less than 5,000 feet, and the ascent to Rinchingpoong about 3,600 feet. We put up in the Llama's house on the ridge of the hill, situated in the midst of barley cultivation. The dwelling consists of one spacious room, in which was a miscellaneous family of men, women, maidens and children, none of whom were at all put out by our presence, but sat round a large fire drinking tea, &c. Some sugar given to a man was handed round the family circle for each to taste, and some hot brandy and water given to another man in the palm of his hand was in like manner handed round to each member to take a sip, after they had retired to rest. The hill tribes are particularly liberal and friendly towards each other, always sharing with their friends anything they may become possessed of.

Simpson and Macpherson left long before daybreak with the intention of walking into Darjeeling, a distance of about thirty-six miles, which they duly accomplished, stopping only to bathe in the Rummàn.

Mine host the Llama was very early engaged in his matutinal devotions, but stopped short in the midst of his prayers and ringing of bells to drink a cup of cocoa, which he seemed to relish with great gusto. A young mother, with an infant at the breast and a deficiency of milk, came in the morning to the Llama, who by a prolonged blowing of short puffs of breath on the naked breasts, was supposed to have administered an effectual remedy. Such is the deception practised on the minds of these simple people by their spiritual guides.

Kemble and I, not being in a hurry, left Rinchingpoong at 8.30. A. M., crossed the Rishee at 10 A. M., and the Rishee cultivation where our first camp was at 10.45 A. M., and at 2 P. M. put up in a hut by the road side near a very small stream about 1000 feet above the Ruttoo. At Rishee we observed a very large flock of Hornbills.

23*rd November*, 1861.—Left our hut at 7 A. M. and reached the Rummàn at 9.30, crossing by a good substantial bridge just completed by the sappers. Reached Goke Guard house at 10.30, halted 15 minutes. Reached Little Rungeet river at noon, where we found our ponies in waiting. Reached Darjeeling at 2.30 P. M. Observed many clearances being made for the cultivation of tea along Tugoor spur, &c.

The coolies who accompanied us consisted of two Lepchas, two Limboos and twenty-one Sikkim Bhooteeas, almost all of whom, as well as their Sirdar named Tinley, were inhabitants of that portion of Sikkim to the west of the Great Rungeet traversed by us. No men could behave better than they did, the words "burra dikh" and "tukleef," so common in the mouths of Hindustanis and Bengalis never escaped theirs, neither did complaints of any kind. Even in sickness, or when suffering from extreme cold, or sore legs, or chapped hands and feet, there was no grumbling. They were always ready to perform their work with a cheerfulness and light-heartedness quite refreshing to witness, after being accustomed to deal with the unmanly and discontented inhabitants of the plains, particularly of Bengal. They all readily and gladly partook of any remnants of food we were able to spare them, as did all the villagers in whose houses we put up.

In the valleys, where Lepidoptera exist in countless myriads during the rains, very few were seen by us, and no Coleoptera at all. *Pyrameis Callirhoe* was common at great elevations. I observed it on the snow, and on the glaciers at 13,000 to 16,000 feet, but it was *the sole inhabitant* of these cold and dreary regions. It is difficult to understand how an insect so delicately formed as a butterfly, could exist at an elevation where the thermometer must have stood at zero at night time. We saw a few small birds resembling larks at Aluhtong, and an occasional eagle, but the absence of all wild animals and game was remarkable. None of the lakes or pools of water, as far as we could ascertain, contained any fish, or any living creature.

From the time we left Darjeeling to the date of our return, a period of twenty-two days, we experienced delightful weather. When in the vicinity of Jongli, the clouds would generally ascend the valleys from the plains between 2 or 3 in the afternoon and obscure the snow peaks for a time, but after an hour or two they would disappear and leave us to enjoy cloudless evenings and nights, and the rare, but truly magnificent spectacle presented by the moonlit snowy masses around us. The great enjoyment and advantages of fine weather, the absence of leeches, pipsas, sand-flies, musquitoes and other such like torments experienced by former Sikkim Himalayan travellers, also the absence of extreme heat, deadly miasma in the valleys, and fear of contracting jungli fever, all point to *November* as the most desirable month of the year for travelling in these still unexplored regions. The third day after our return, the weather suddenly became raw and cold. At Darjeeling we had rain and hail, and the military stations of Jellapahar and Sinchul were covered with hail and snow. At the latter place the fall was $3\frac{1}{2}$ inches thick, and remained for several days on the ground.

Camp; March, 1862.

Notes of a trip from Simla to the Spiti Valley and Chomoriri (Tshomoriri) Lake during the months of July, August and September, 1861.—*By* W. Theobald, *Esq.*, *Jnr.*,

The object for which the present trip was undertaken, was to acquire some definite information regarding the interesting fossiliferous deposits, both of Palæozoic and Mesozoic age, known to exist in the Spiti valley and the higher Himalayas, to ascertain as far as a cursory examination would permit, their extent, and relations to the older groups in contact with them, and to collect such a series of fossils from them, as should facilitate the determination of their age in the geological scale, and thereby afford a key for the approximate determination of the age of those older groups, in which fossils are either rare or altogether wanting. These objects have, I trust, been to some extent accomplished, though I shall not now touch on geological questions, which, with the result of the examination of the fossil collections, will appear elsewhere at some future period. In the meanwhile I have put together a few notes of a general character, in hopes that they may prove of some interest or service to any one about to travel over the same ground.

I may, in the present place, perhaps be expected to allude to two papers by Capt. Thomas Hutton, entitled "Journal of a Trip through Kunawar, Hungrung and Spiti, in Vols. VIII, and IX, of the Asiatic Society's Journal for 1839 and 1840," and a "Geological Report on the valley of the Spiti and of the route from Kotghur, in Vol. X, of 1841."

Of the first of these, I have little to remark; but, as regards the second, I must deny the applicability of the term *geological* to such speculations as it presents. Capt. Hutton has, in fact, fallen into the not uncommon error of confounding cosmogony with geology, although they have no more in common than the alchemy of the Middle Ages possesses with the science of modern chemistry. To attempt the serious refutation of some of the views of Capt. Hutton, on subjects connected with geology, would be almost as hopeless, not to say absurd, as for a surgeon to discuss the treatment of Aneurism with a man who denied the circulation of the blood; and I must, therefore, excuse myself from entering at any length on the merits of the views of cosmogony and creation set forth in the above paper: but they are, I fully believe, as ingenious as

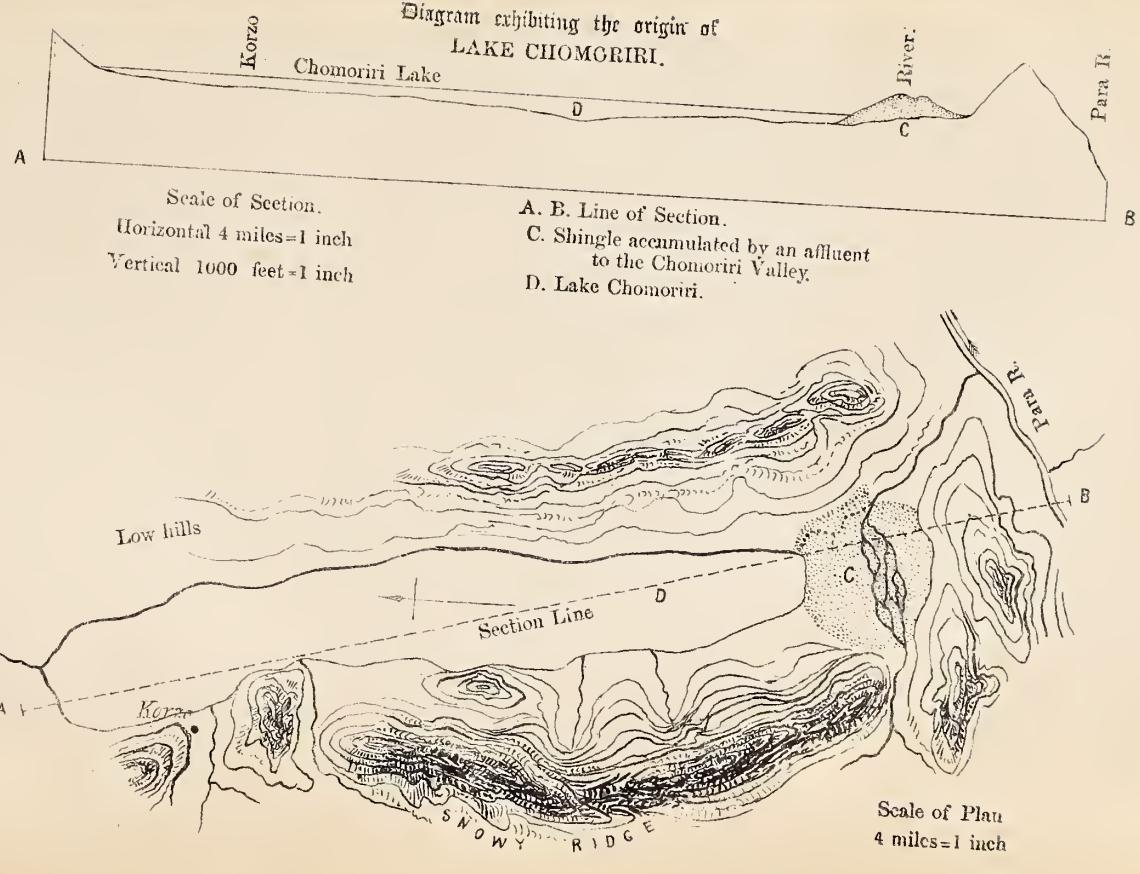


Diagram exhibiting the origin of
LAKE CHOMORIRI.
Korzo
Chomoriri Lake
River
Para R
A
D
C
B
Scale of Section.
Horizontal 4 miles=1 inch
Vertical 1000 feet=1 inch
A. B. Line of Section.
C. Shingle accumulated by an affluent to the Chomoriri Valley.
D. Lake Chomoriri.
Low hills
Section Line
SNOWY RIDGE
Scale of Plan
4 miles=1 inch

such speculations usually are, and, by originality and bold disregard of the most obvious conclusions of geology, deserve honorable mention among the choieest of those similar schemes, which the late Hugh Miller has rescued from oblivion, and embalmed in his witty and laughable chapter on the geology of the Anti-geologists.

When starting myself on this trip, I greatly felt the want of a few hints regarding the equipment requisite; such as the best form of tents, the amount and sort of stores, and the number of servants necessary, &c. I shall, therefore, offer a few preliminary remarks on such subjects, many of which must appear very trivial to any one unacquainted with the vicissitudes of Himalayan travelling, but which may be better appreciated by the traveller on the eve of undertaking a similar journey.

It need hardly be stated, that coolies are the most convenient kind of carriage for the Himalayas; though in many parts, ponies, mules, or yaks may be substituted; as a rule, however, all baggage should be so adjusted, as to be capable of being carried by a single man, as though along made roads heavier loads, requiring two or more men, may be found convenient, such loads are very unsuitable, and occasionally utterly impracticable, along the difficult paths, which will inevitably be met with during a prolonged journey in the hills. Regarding coolies, there is scarcely any serious difficulty in procuring as many as may be required in moderation, though the plan which I adopted, and it is one possessing certain advantages, was to engage in Simla, for the entire trip, half the number of coolies I required; this plan involves a little extra expense in many ways, and is strictly speaking unnecessary, but from experience I should recommend its adoption by others, and should certainly follow the same plan myself on any future occasion.

The daily rate of wages for a cooly throughout Bissahir and Kunawar is four annas, and in the British district of Spiti two, though the shorter stages often met with in Spiti causes the price of carriage in reality to assimilate nearer than might be supposed. I have often heard the higher rate of wages in Bissahir complained of as exorbitant, and our Political blamed for not causing a reduction to be made; but very unreasonably so, I think. It is frequently urged that, as the majority of men in the hills who carry a traveller's baggage from day to day, are employed in and gain their livelihood by

agricultural pursuits, half of the present rate would be an adequate and acceptable remuneration to the men, whilst at the same time a great pecuniary relief to the traveller. Parties who argue thus, would probably esteem it a more thorough sort of relief, to at once resort to the old "begarec" system of gratuitous or forced labour, once recognised and prevalent in the hills when European travellers were rarer than at present; and as no one class of the population could gain a living by this inoppressive system (to the pockets of the traveller), the entire population, who in turns would have to surrender their services, would be led to entertain an appropriate sense of respect for their vagabond lords and of the manifold benefits conferred by their presence. The time has, however, arrived for native customs of this description to give place, and for us to regulate our conduct towards natives of this country by rules consonant with European rather than Asiatic ideas. Endeavouring, therefore, to estimate the amount of what may be considered a fair day's pay for a fair day's work, I confess that four annas does not appear to me an extravagant charge; that is, for an average march of fourteen miles, often along extremely bad and difficult roads, over which the cooly has generally to return empty-handed.

A far juster ground of complaint than the rate of cooly hire or wages, is the capricious rate at which flour is sold to the traveller, and as a matter of justice, I was forced to make up the difference to my servants, when the price rose above nine seers for the rupee, as otherwise their wages would have barely sufficed, in some places, to provide them with flour alone, since in some villages of Kunawar I got no more than five seers for the rupee. This I believe to have been an imposition, though it must be remembered, that wheaten flour is not the staple of the district in these places, but is imported for the use of travellers. At Korzo, at the western extremity of lake Chomoriri, I got four and a half seers, and was told that it was no more than twelve seers per rupee at Lè or Ladak. One circumstance which proves that this was not an altogether fictitious price, put on for the purpose of profit, was that, though paying this high price, I was unable to get as much as I required, and was forced to take rice and sheep to feed my people, as well as flour.

By order of the Maharajah, I believe all officers attached to the Grand Trigonometrical Survey, in his territory, are supplied at the rate

of forty seers of flour for the rupee, but this is I consider a manifest oppression, though many English gentlemen are not ashamed to avail themselves of a despotic order to live cheaply. When I visited Kashmir in 1853, I sometimes had to contest with the native officials about supplies, coolies, &c., but they generally concluded their own demands by observing that *I* was their Hakim, and that the Maharajah would slit their noses if I had any cause of complaint. In like manner the headman of Korzo frankly declared, that if I chose to take provisions by force I could do so, at my own rates, but that he could not sell to me freely at a lower rate than one rupee for four and a half seers. Other travellers I know got their flour here at one-third of this rate, but I consider it neither just, dignified or politic, for English gentlemen to travel through native states dictating their own rates, and brow-beating the authorities in virtue of their being Englishmen. On referring moreover to Cunningham's Ladak, I see he states sixteen seers as the price of flour at Lè in 1847, so that twelve seers is not probably a greater advance in price than would naturally take place in such a famine year as 1861, and not to be compared with the rise in price in Hindustan. The staple supplies of flour, ghee, salt and mutton are nearly every where procurable, but all other articles of consumption, as sugar, tea, spices, rice, onions, &c., must be taken from Simla in sufficient quantities for the trip, being rarely procurable elsewhere. The following articles will also be found very useful, either in case of actual short commons, or by way of change from the everlasting mutton and chupatties, viz., preserved soup and vegetables, spiced beef and sausages in 1 lb. tins, sardines, plain biscuits, a small cheese, and some pigs' cheeks or pieces of bacon of about 6 lbs. each, which last keeps well and will always be found useful.

Wine or spirits, though not requisite at low elevations, are greatly needed in the higher ranges and plains of Ladak, and it is a real hardship to run short of them in tents, when the thermometer is at or near 30°. For a three months' trip, however, not more than seventeen to eighteen coolies are requisite. I took but thirteen, one of them taking a servant's tent, which is not requisite in Kulu or Bissahir, but is absolutely necessary in the colder parts of northern Kanawar and Ladak.

A comfortable sleeping pâl which can be carried by one man, (another taking the poles,) will be found most convenient, with a

proper supply of iron pegs, in case of the ground being stony or frozen:—the ordinary blanket tent used by some, lined with wax cloth, being in my opinion inconveniently small, especially if two or more constitute a party. At the same time in no case should the tent be too big for one man to carry.

As regards servants, it is by no means easy to dispense entirely with Hindustanis, though the majority of them are badly suited for hill travelling. Musalmans are far preferable to Hindus, as from the nature of their food they are more capable of enduring the rigour of the climate at a high altitude. One or two men should, however, be added to the party who are familiar with the language of the parts to be traversed, and I found nothing so inconvenient as the want of a man who could hold converse with the people of Spiti and Ladak, which none of my men could do properly.

Another very necessary thing is to be provided with an ample supply of good *English* walking boots, and thick woollen stockings. I found the coarse native stockings, which can be got in Simla, three pairs for a rupee, answer very well, though the European article is of course preferable. I have seen much inconvenience caused from want of proper boots, which wear out with unexpected rapidity in the hills, especially during wet weather, and if the same boots are continued in wear when wet. I have seen it recommended in some work, in case of a new boot proving tight, to break an egg into it *before* putting it on, but a preferable plan I have found to be filling the boot with warm water after it is put on. The surest plan, however, to secure comfort in walking and avoid troublesome blisters on the feet, is to have boots made large enough to admit of two pair of thick woollen stockings being worn with them. The relief this plan affords is wonderful.

Powder and shot are articles which of course must be taken as well as lead, and small quantities of either form very acceptable presents to village headmen and others for any trifling services. The summer time is, however, not the best for sport, as below the forest line the jungle is too thick to enable one to see any distance, and in the higher hills the game is distributed over a large area, which in winter is inaccessible to them and circumscribed by snow.

Throughout Bissahir and Spiti, the people seemed to have little taste for shooting, though numbers of Burrel and Ibex are slaughtered

every year in winter time, as proved by the number of horns which ornament the piles of stones near many of the villages. In Spiti the Burrel horns are common, but I only noticed horns of the Ibex in the Peen valley.

One reason perhaps of my meeting with no game, was from my not going after it, and rarely halting in the same place two consecutive days. Yet traversing unfrequented mountains as I did, without by chance meeting anything, proves the great scarcity of animals, and similar complaints I have heard made by others. The best shooting in fact about Simla may be had along the road. Pheasants being plentiful and Chakor also all the way to Saraon, the farthest Bungalow as yet completed; five sorts in all being procurable, viz., 1st, the Monal, *Lophophorus Impeyanus*, Latham; 2nd, the Argus, *Ceriornis melanocephala*, Gray; 3rd, the Koklas, *Puchrasia Macrolopha*, Lesson; 4th, Kalij, *Euplocomus albocristatus*, Vigors; and 5th, the Cheer, *Phasianus Wallichii*, Hardwicke, the last only being a true pheasant, and perhaps the least attractive of the lot. No painting can do justice to the gorgeous beauty of the Monal, the cock of which is resplendent with burnished azure with a golden irridescence, such as the bird of Juno can only rival in the Old World, or those winged gems, the true humming birds, surpass in the New. A handsomer bird, however, in my opinion is the cock Argus with, when living, its superbly coloured gular sack and head lappets and the beautiful contrast which its white spots of unsullied purity form with the rich warm tints of the body plumage. The koklas and kalij are both also eminently handsome birds, that is the cocks in their spring plumage; the hens of all being more sombre-coloured and less attractive.*

No person starting for the interior should omit a few articles to enable him to preserve any object of interest he may meet with, such as a pot of arsenical soap, four or five broad mouthed stone jars filled with spirits of wine and well corked (good corks are far preferable to glass stoppers) to receive snakes, bats, &c., and a few small glass

* Any person desirous of procuring skins or other objects of Natural History, can do so by addressing A. P. Begbie, Esq., Simla, as that gentleman has many Shikarries always employed in collecting and preparing skins. A case containing good skins of all the above pheasants and also skins of the snow pheasant, *Tetraogallus Himalayanus*, Chakor, *Cacabis chakor*, and the black partridge, *Francolinus vulgaris*, in all 24 skins, will cost eighty rupees, a price which those who know the expense attending collections, will not consider excessive.

bottles for insects, filled to near the top with spirit; a dozen quires or so of large bazar paper with a couple of pressing boards and straps for ferns, &c.; a broad mouthed glass bottle with a false bottom of card, filled up with ammonia for capturing and killing moths, and pins and a few soft deal store boxes, pill boxes for shells, a hammer and chisel, compass and telescope.

To economise spirit, a jar should be devoted to the reception of recent captures, into which all animals may first be placed *after removing the entrails*, and allowed to remain for a couple of days. From this jar, they may then be transferred to a store jar, the spirit of which, by this plan, will not require to be changed, the spirit in the first jar alone requiring occasional renewal, as it gets foul by use. Unless an animal is opened and the entrails extracted, it is hopeless to suppose that it will keep well, as the access of the spirit is not sufficiently free to effect the preservation of the contents of the abdomen, not to mention the saving of space as well as the better preservation of the specimen this simple operation secures. All small mammals and lizards, and snakes up to 3 or 4 feet in length are most effectually and easily thus preserved.

It is a mistake too to suppose, as some people do, that a skin can be properly prepared at any time, if once dried. No skin can be properly prepared that has not been preserved with arsenical soap when fresh,—I mean for museum purposes, as of course a coarse hide may be tanned at any time,—and it is best, therefore, never to defer the process till next day, however tired one may be, if the specimen is of interest; neither is it safe to trust to a servant in such matters. Some small work, however, on Taxidermy should be procured by any one who has not previously made the subject a study, and is at the same time anxious to collect during the trip. Skulls of animals are comparatively easy to procure and carry, and are always worth so doing; but most people adopt a ruinous plan to prepare them, viz., by macerating in water or burying them. This may clear them of flesh, but it will cause the teeth to fall out. Whilst travelling, the best plan is simply to pare off the flesh and dry them, with the ligaments and lower jaw attached, in the sun, extracting the brain through the occipital foramen, without however enlarging the aperture. By this means the teeth remain fixed and the skull can at any subsequent period be properly cleaned and whitened with one or two coats

of whitewash put on and brushed off. Or, if left undisturbed, the small beetles and flesh eating larvæ will very beautifully clean in this country heads thus dried with the flesh on them. The horns too of the sheath-horned ruminants (antelopes, sheep, &c.,) require to be touched with some preservative, especially where inserted in the skin, as they are otherwise liable to be eaten and disfigured by insects.

July 7th, Mahásu.—Having completed my preparations, I left Simla on the 7th of July, and marched as far as Mahásu, the first bungalow on the new road. As usual on first starting, I had some difficulty with the coolies, some of the loads proving too heavy, and I at that time having several double loads carried by two men, a plan productive of much annoyance, and which I afterwards abandoned. The bungalow, like all those along the new road, was a very clean and comfortable one, and prettily situated in an open forest of the usual character of the pine and cedar forests around Simla. As far as Bowlee bungalow, the road is excellent, and the ascents and descents are mostly very gradual. Between Bowlee and Saraon (a few miles beyond which the road terminates abruptly) the road is generally good, but contains some very long and steep ascents; the Nogri bungalow being situated on a feeder of the Sutlej at about the height of Rampore, and hardly, I should suppose, in a situation exempt from malaria during autumn.

The views obtainable from many parts of this road are beautiful in the extreme, the Sutlej being often seen winding its way many thousand feet below the road, through a wild rocky glen, bounded on either side by precipitous mountains, clothed to their very summits with primeval forest. In other places, extensive patches of cultivation and thriving villages may be noticed, embosomed in fruit trees, among which the apricot, walnut and peach are most conspicuous, and whose waving crops of bátu, of a deep crimson when ripe, offer a striking contrast to the paler and more subdued tints of other cereals. The hills round Simla, however, are in many directions singularly bare of trees, the station itself being rather centrally situated in a wooded tract of rather circumscribed dimensions. All travellers in the Himalayas are acquainted with the very capricious manner in which one face of a hill will be clothed with forest, whilst the rest is bare; but much of the barenness of the hills round Simla is, I think,

unquestionably produced by clearing; and one of the most disagreeable sounds to me, occasionally to be heard in Simla itself, is that of the woodman's axe slowly but steadily clearing a way through those umbrageous forests, at present the ornament and glory of the station. Closely connected with this subject is that of the supply of water, which of late years has been found to fail and prove inadequate to the wants of the inhabitants; this may in part arise from the growth of the place, but the actual supply of water furnished by the springs has, on undoubted testimony, alarmingly diminished of late years. The authorities have driven a tunnel into the hill side not far from the Church, with the view of tapping fresh sources of supply, but taking the nature of the ground into consideration, I have no great hopes of the success of the plan. A far more certain and practicable method, it seems to me, would be to construct a series of dams across the narrow nullah intersecting the station, giving rise thereby to a number of small pools one above the other, whose aggregate capacity would be very considerable, some of which might be reserved for drinking, and the others for washing and general purposes. As the nullah has a rocky bed, no difficulty would be experienced in constructing masonry dams of the requisite strength and proportions. A few miles from Simla the road passes through a tunnel of some hundred yards in length, excavated in massive schists, but very wet and slushy under foot from incessant drippings from the roof, to drain off which no provision appears to have been made.

8th, Fagu, 8718 ft.*—This bungalow is situated on the old road, but is much frequented being an easy march from Simla, and though small, prettily situated. The road between Mahásu and Fágu is well wooded and very picturesque, the road in many places affording a

* All heights marked thus * are from observations made with two carefully compared boiling-point thermometers by my colleague Mr. Mallet, and the few taken by myself are made with an ordinary thermometer corrected by comparison with the above instruments. The tables used in calculation are Boileau's tables published at Meerut in 1849. It is important to state this, as the tables of Col. Sykes supplied with the boiling-point thermometers, (Casella's Thermo-hypsometer) give a much too low result, amounting at the Parang Pass to a difference—991—compared with result of a calculation on the same observation by Boileau's formula, which, as far as my scanty means of verification go, appears to give the more correct result. The following are the heights determined by my colleague Mr. Mallet in a part of the valley unvisited by me.

Shalkar, 10089. Changrizang, 12120. Huling, 10598.
Sumra, 10624. Lari, 10845. Thabo, 10804. Po, 11424.
The heights are those of the camping ground of the respective villages.

profusion of wild strawberries which, though of a beautiful colour, are watery and insipid. Near Fagu I first obtained two species of limax which I believe are undescribed, and which are not uncommon along the southern side of the Sutlej at elevations between 6000 and 9000 feet. The largest may be thus described :—

Limax altivagus, n. s. Corpore limaciformi, pallio lente-granuloso, dorso rugose reticulato, more frondis brassicæ, colore virescente-fusco sive lutescente-fulvo, interdum nigrescente, et rarissime pallide aurantiaco pallio, minus colorato corpore. Tentaculis quatuor nigris, capite nigro, infra pallescente. Ano ad dextrum latus pallii, prope marginem posito, ad mediam partem vix attingente. Longitudinis (corpore extenso) 9 unc. Habitat montibus cis-Sutlejensibus prope Fagu Narkanda, Saraon &c. 6000 ad 9000.

This limax is rather variable in colour, and large specimens, when in motion and extended, exceed 9 inches, though their ordinary dimension is about 6. It feeds on fungi.

The second species of limax is much smaller and rather more elegantly-shaped, and occupies the same tract of country, and is perhaps rather more numerous, though the first is far from uncommon.

Limax modestus n. s. Corpore limaciformi, postea acuminato, colore cinereo, fuscis punctis notato ; dorso duobus lineis maculosis cateniformibus ornato, a sese et a margine equidistantibus et a pallio usque ad extremitatem extensis, spatio his lineis incluso paullo fuscente et elegante fuscis lineis striato et marmorato. Tentaculis quatuor rubro-fuscis. Longitudinis $1\frac{1}{2}$ unc. Habitat cum precedente.

Vitrina monticola, B. also accompanies the above. The animal is about 2 inches long, colour pale reddish brown, paler beneath. Tentacles dark. Spire covered by mantle. A thin dorsal keel down the body in front of the shell ; shell carried in the centre of the body. Tail compressed, obliquely wrinkled, and truncated. Anus situated at the extremity with a small overhanging tentacular pore.

This vitrina is very generally distributed, though individuals are nowhere numerous, and it appears to be the favourite food of the toad.

*9th, Theog.** 7192 ft. A short march to the next bungalow on the new road, distance about six miles. I was much annoyed at this bungalow, as well as at some others, by the multitude of house flies which at this season are perfect pests. A pair of swallows had com-

menced a nest in the verandah, but did not appear to prey on the flies which swarmed in the rooms, though it may have been timidity which prevented their entering. Along the road, one or two species of flower-eating beetles were common, and exhibited considerable agility and powers of perception, flying away readily on any attempt to capture them. Towards dusk, numbers of a beetle having the heavy flight of our English melolontha made their appearance, but it was too dark to capture many, though flying round the bungalow in considerable numbers.

10*th*, *Matiána*, 7700 ft.*—A rather pretty march, the road winding round the head of the deep valley beneath Theog. Pheasants are plentiful, and in the glens I heard the bark of the kakar (*styloceros*), but the vegetation was too thick to afford much chance of sport to a single gun. Musk deer are found near Matiána, and in winter time bears.

11*th*, *Narkanda*, 8796 ft.*—A longish march, but along a very pretty road: indeed no part of the hills I think prettier than the country round Narkanda. The bungalow is situated on the ridge separating the drainage of the Sutlej and Jumna, and close to the verge of a magnificent forest. From the verandah a fine view is obtained of the lower slopes of the hills, leading down to the Sutlej and the village of Kotgurh at which is a resident Missionary (recently deceased), who has a tolerably attended school near the dâk bungalow. The mission house is a neat building with vines trained over the verandah, and the native catechist is also provided with a very neat cottage close by. Narkanda being the last place at which potatoes are procurable, the traveller should lay in a supply there, as no sort of vegetable is procurable in the higher hills, except the green leaves of the bátu which form tolerable spinage, and the young shoots of fern which are not unpalatable. About Narkanda many *rous* trees are found, which make capital walking sticks, the wood being hard and straight grained. Hazel trees are also plentiful, the nuts ripening about the end of August.

12*th*, *Kotgurh*.—After leaving Narkanda, the road winds through fine forest, many of the pines and cedars being truly magnificent trees. Kotgurh is situated on the old road at an elevation, I should think, of less than 6000 ft., and about four miles from the Sutlej. The first half of the march is along the new road to a spot where a small

wooden temple is erected, where the footpath to Kotgurh branches off. The descent from this is in places very steep, and after rain rather difficult, from the slippery nature of the stiff yellow clay over which the path lies. At Kotgurh, besides the Missionary stationed there, is a gentleman of the name of Berkeley who is engaged in tea-planting; and a retired officer, named Begbie, also has a house in the neighbourhood which he occasionally occupies. Mr. Berkeley's house is near the highest limit at which the tea-plant will thrive, and his chief plantations are at a somewhat lower level; but the quality of the soil has also considerable influence, and varies considerably, probably according to the nature of the rock immediately beneath it. Kotgurh, from its low elevation, is hot and sultry, and not exempt, I should think, from malarious fever. The vegetation round it is rank in all open spots, and rice is grown just below it. Bears and leopards are found in the forest above it, the last animal being far more numerous than might be suspected. Several have been taken in traps near Simla this season, (as many as three in one month by the same individual), but yet it is an animal which is never seen abroad in the day time. The bears are the black hill bear *(Ursus Himalayanus)* a perfectly distinct animal from the black bear of the plains, and considerably smaller, to judge by the relative size of the skulls of the two species. The plain bear is in fact another genus *(Procheilus labiatus)* and the skulls may be readily discriminated, as the former has six incisor teeth in the upper jaw, whilst the latter has but four.

15*th, Nirt-chokee.*—Nirt is situated on the banks of the Sutlej, and the descent to it from Kotgurh is in many places extremely steep and difficult. The Sutlej is here under 100 yards broad, and rushes over a rocky bed, the whole valley being so contracted as to afford few open patches fit for cultivation on either side. At this low level the heat is very great, and the hills are covered with the same sort of cactus which occurs round Subathu and Kasouli. Pipal trees are also met with near villages, but all of them planted, and none occur much above Rampur. Remnants of terraces of old river shingle may here and there be noticed at different heights; some at not less than 500 feet above the present level of the river. These evidences of former river action have induced some writers to indulge in fanciful speculations respecting vast cataclysms, and the sudden disrup-

tion of rocky lake barriers along the course of the Sutlej, but they are rather to be regarded as a guage whereby we may estimate the extent to which the Sutlej has deepened its channel by the ordinary process of erosion during the most recent geologic periods. Cataclysms produced by landslips or the descent of glaciers into a river bed, however devastating in their effects, are quite incapable of giving rise to such regular deposits of sand and shingle as constitute the elevated terraces along the Sutlej; neither have I anywhere seen deposits of such a nature as to induce the belief of their lacustrine origin, as they every where present the appearance of ordinary river sands and shingle, such as in the present day are forming in existing river channels. In the village is a Hindoo temple in a ruinous condition, with images of Bulls and Lingums, and the whole place presents an aspect of dilapidation and decay.

16*th*, *Rampur*.—Passed the village of Datnaga, near which the Sutlej is spanned by a jhula bridge. A good deal of cultivation exists hereabouts, and transplanting rice was being carried on vigorously. The town of Rampur is snugly situated within a bend of the river, which here rushes impetuously through a narrow rocky bed, hurrying down numberless pine logs at a rate of some six miles an hour.

Above the town are some commodious native houses, a temple and a large, well built room facing the river, for the convenience of travellers. In the temple are two figures of Devi and some other goddess, with silver faces and a profusion of long hair. When I was there, these images were brought out and paraded, with music and attendants waving chouries over them. They were carried on a litter placed on two very long and elastic poles, supported by a man at either end, after the fashion of a sedan chair; and at intervals the bearers would, by means of the elastic poles, jerk the images violently up and down, causing their long ringlets to fly about their ears in a mad fashion, to the intense delight of the spectators, comprising many of the elders and most of the juveniles of Rampur. This strange manœuvre was, I think, a clumsy attempt to represent the inspiration and actual presence of the divinity in her idol, thereby imparting to it life and motion, as in Bengal the idol of Kali is, during the festival of the Durga Pujah, supposed to be animated by the spirit of the goddess, and is thrown away uncared for, when the "real presence" (to borrow the appropriate catholic phrase) is supposed to

be no longer in force. How clumsy, however, the whole performance, when compared with the somewhat similar, but vastly more refined deceptions of the inspiration of the Pythoness or Priestess of Apollo when delivering the responses of the god.

" Cui talia fanti
Ante fores, subito non vultus, non color unus,
Non comptæ mansere comæ, sed pectus anhelum,
Et rabie fera corda tument, majorque videri,
Nec mortale sonans, afflata est numine quando
Jam propiore dei." *Virg. Æneid.* vi. 46.

I have subsequently been told that this ceremony is had recourse to, when some special visitation is to be averted, and in the present instance was intended to put a stop to the severe cattle murrain which this year has swept the hills and caused immense loss in Bissahir and Kunawar, affecting both cattle, sheep and goats; and these animals had been driven away from most of the villages I passed through in the valleys to the higher mountains, in order to escape the disease, which is most prevalent at lower levels. The houses at Rampur are all covered with thick rough slates, and are many of them built in the form of a square, with an open courtyard in the centre into which the rooms open. Cloth and blankets are manufactured here, and a little trade is carried on by means of mules, of which I noticed a good number grazing in the neighbourhood; but the bazaar is wretchedly supplied, and nothing but the most ordinary necessaries is procurable.

17*th*, *Gaora.*—The road, after quitting Rampur, keeps for some distance along the Sutlej, and then rises up a steep but picturesque ascent to the village of Gaora, prettily situated on a rocky but well wooded slope. The apricot harvest is now being collected, and every house top is seen covered with the fruit spread out to dry. The finer fruit is dried or eaten fresh, but the poorer is heaped together, till it becomes pulpy, and then thrown away, after extracting the stones, the kernels being reserved to make oil. A familiar plant common round Gaora, and recalling many pleasing reminiscences, is the mistletoe, which grows here as luxuriantly on apple trees as in any orchard or park of old England. Blackberries too are tolerably common and very pleasantly flavoured, and also a small berry which grows in astonishing profusion, and is, I think, a species of carissa or some

allied plant. These berries are pleasant to eat either raw or stewed; and their expressed juice is of an extremely dark and beautiful purple, and, when mixed with a proper amount of sugar and spirit, and flavoured with a few peach kernels, forms an extremely elegant liqueur. The hemp plant grows here in the utmost profusion as a common weed, and indeed everywhere in this part of the Sutlej valley below 7000 feet, but does not seem to be cultivated, though the soil and climate appear to suit it perfectly. It being very wet and the ground completely sodden, I preferred putting up in the verandah of an empty cow-house to my tent, though the midges and fleas in such places are usually very annoying. I was provided, however, with musquitoe curtains, which relieved me almost completely from the attacks of these tiny but implacable enemies, and I would advise no one who values a good night's rest, to travel unprovided with this article.

18*th*, *Saraon*, 6632 ft.*—A rather severe march, the road about half way descending into a deep valley and ascending again on the opposite side by a very steep and in some places difficult path, and joining the new road a few miles from Saraon bungalow, which is the last one completed along the new road. During the summer months, this is the residence of the Bissahir Rajah, a stout sensible young man who speaks English tolerably, and who rode down alone to the bungalow, on hearing of the arrival of a European, unattended by the ragged mob of followers which natives of his rank usually consider necessary for their dignity to carry along with them.

19*th*, *Taranda*.—A rather long but very picturesque march, for the first few miles along the new road, through pine forest, or along the sides of precipitous rocky glens opening down to the Sutlej, of which glimpses are now and then caught. The camping ground is situated on the crest of a rather lofty spur, in the midst of a forest of really magnificent cedars, at some little distance above the village.

20*th*, *Nachár*.—About six miles from the last camping ground is the Paindah bungalow which, though finished, is not regularly opened. Before reaching it, the road descends into and crosses a large valley, on the opposite side of which the bungalow is built. Bears, I believe are found in the vicinity, and I have rarely seen ground which I should think would afford them better cover. Before reaching Nachár, a large village is passed, situated on the verge of a forest of the most magnificent cedars I ever beheld. The profound stillness which

reigned here, combined with the subdued light caused by the spreading boughs of these majestic trees, (the only sound indicative of life being the melancholy coo of a wood pigeon,) exerted a very solemn influence on the mind, such as all must have experienced who have trodden alone the depths of a pine forest either in India or Europe. One of the largest of these trees measured 36 feet in girth, and at about 10 feet from the ground divided into two trunks, each in itself a tree of superb dimensions. No other tree near the road approached this in size, but numbers of single trees must have measured fully 20 feet in girth, and in their growth were as straight as arrows.

By the time I reached Nachár, the rain was falling in torrents, and I was glad to take shelter in a sort of rest house, in preference to my tent which was dripping wet. The building was open on all sides, being merely a pent roof of massive shingles supported by pillars formed of short cedar logs laid cross-ways on each other, and underneath having a sort of kitchen in which the servants found shelter and were enabled to prepare dinner. The houses in Bissahir are usually regular and substantial buidings, built of alternate courses of cedar timbers and rubble masonry, and often two or three stories high, with projecting eaves and a balcony running round the upper story, which gives them much the appearance of a Swiss chalet. They have often pent roofs, formed of a double layer of stout cedar planks or shingles, some three inches or more in thickness, rudely dressed with an axe, and ranged at right angles to the ridge pole. These, as may be imagined, form a very inadequate protection from the rain, but have the advantage of giving ready exit to smoke, through the gaping interstices between the planks. Another form of roof equally prevalent is flat topped and formed of beaten clay. On these roofs grain and fruit are spread out to dry, as opportunities offer for so doing between the showers during the rainy season.

21*st*, *Chargaon.*—Quitting Nachár the road descends to the Sutlej at Wangtu (or, as it is pronounced, Oángtu) where there is a handsome wooden bridge. The river here rushes through a narrow rocky channel not more than sixty feet broad. On either side two square towers are erected of alternate courses of cedar beams and large stones. From beneath these, three tiers of pine trees project over the river, having a considerable upward slant, and each tier consisting of four large trees a little advanced beyond the one supporting it, the whole

firmly held down by the towers or gateways, which, for greater security, are filled at each side of the roadway with stones to the height of three or four feet. From the ends of the uppermost or most projecting tier of logs, two trees are laid across, spanning the river, and on which a roadway of planks is firmly secured, forming a very safe and easy bridge over which a horse might easily be taken. Shortly after passing the bridge, the Wangur river is crossed, a turbulent brawling stream which descends from the Baba pass and enters the Sutlej above Wangtu. After crossing the Wangur, the road ascends a ridge which is so precipitously scarped by the Sutlej that no path round it exists, though one could readily be made at a small cost and a troublesome climb thereby saved. From the summit of this ridge the road descends gradually to the Sutlej, along which it keeps till near Chargaon, which is situated on a cultivated slope at some height above the river. In some places the road is very steep and difficult, and had been much damaged by the heavy rain of the previous day. Near Chargaon I saw a pair of Goral *(nemorhœdus)* and some pigeons, among the superb cliffs overhanging the Sutlej. On the opposite side of the river, the banks were very precipitous and scored by numberless "shoots," down which pine logs would occasionaly come rolling and plunging with heavy thud into the river below. So steep, however, is the incline, and so clumsy the mode of sending down the timber, that I think more wood is spoiled, than finds its way into the river in a sound state, and when in the river, the loss among the logs, by stranding or remaining in some eddy or reach till they rot, must constitute a very large percentage on the number that eventually reach the plains. This state of things will of course continue as long as any timber merchant or agent is permitted without any let or hindrance to destroy whole forests, by a reckless system of clearing, having nothing in view but his own profits, and not caring if fifty years hence not a stick remained large enough to make the handle of a broom out of. This is surely a matter calling for Government interference, though a topic I cannot enlarge on here, but content myself with expressing a hope, that something may be effected to retard this wholesale and wanton destruction of our forests, and a remedy not applied only when the mischief done has almost become irremediable.

22*nd*, *Meru.*—A short march of not more than seven miles. The camping ground, a dirty spot in the midst of the village.

23*rd, Chini.*—A stiff march, the road often steep and difficult, especially near Chini where it is in some places carried along very precipitous ground by means of stairs and scaffolding. Near Chini saw two bears in the valley beneath the road, but sport must have greatly deteriorated since Col. Markham saw bears in the Busba valley, (across the Sutlej,) feeding literally by dozens on the hill sides. At Chini there is a large, but unfinished and comfortless bungalow, and close to it some fine old poplar trees. The village is wretchedly small, though there is a very large spread of cultivation near, and supplies are dear and with difficulty procurable. Height 9096 feet, the village being about 3000 feet above the river.

25*th, Pengi.*—A short and uninteresting march, the trees in places dwarfed from the close proximity of the uppermost limit of their growth. On the hills across the Sutlej, the highest limit of trees is sharply defined and is somewhere about 12,500 feet. Poplars, apricots and walnuts plentiful and thriving round Pengi, and also excellent blackberries, or the Kunawar representative of that home fruit, which with the addition of a little sugar formed a very palatable desert. In the vestibule of the temple of Devi at this place, I noticed some fine apricots hung up, which called to mind the ancient Roman custom of votive offerings to the rural deities—

"Flava Ceres, tibi sit nostro de rure corona
Spicea, *quae templi pendent ante fores.*" Tibullus, El. I.

One of my Hindustani servants, who let no opportunity slip of exhibiting their own superiority and contempt for the unsophisticated inhabitants of the hills, enquired of the headman somewhat superciliously, of what use the apricots were to Devi—"Did she eat them?" His reply rather pleased me, for instead of returning an abusive answer, as any Hindustani would have done in the plains under such provocation, he quietly asked who it was that caused those same apricots to grow. "If you" he continued "can make so much as one such apricot grow, I myself will give you five rupees for it." This reply, made with much dignity and without any temper, was evidently not what my servant expected, and completely silenced him, for he had sense to perceive that his sarcasm had failed to produce any irritation, and that he was getting the worst of the discussion.

At this village I got the skin of the lesser flying squirrel, the fur of which is beautifully soft; the larger species I have shot at dusk in my own compound in Simla, and both appear pretty generally diffused and not rare, though from their crepuscular habits they are not often seen.

26*th*, *Gaugera*, 11294 ft.*—This is a mere camping ground, about 500 feet below the upper limit of trees. Wild thyme and other flowers abounded and a species of potentilla, with thicker and more downy leaves than that which grows at a lower elevation. Many of the plants which occur at high elevation are possessed of an aromatic fragrance and leaves furnished with down, as though to meet the increased rigour of the climate.

27*th*, *Lipe*.—On quitting camp, the road immediately commences to ascend, and crosses a pass of some 14000 feet, to which no name is given in the map. Wild flowers were growing in great profusion near the summit among the rocks, and some way down on the other side birches and rhododendrons. Lipe is situated on the northern bank of a considerable stream, which is crossed by means of a wooden bridge. A little above Lipe vast beds of river sands and shingles, some 250 feet thick, are seen reposing on the rocky slopes of the gorge, some 600 feet above the present level of the river; and much of the cultivated land below the village is on a river terrace which has been abandoned by the stream during a comparatively recent period, the river having worn for itself a deep channel, almost a rapid, on the opposite side. Close to the river are extensive vineyards, but the present year has been unfavorable for grapes, especially about Chini where the vines have almost entirely failed. About Lipe there was better promise of fruit, but it was too early in the season when I was there, to get any.

28*th*, *Tabang*, 11755 ft.*—A very short march, the road rising considerably from Lipe and crossing a low pass, near the summit of which I noticed small rhubarb plants among the furze covering the hill side, and also a few straggling cypresses, which certainly ill-deserved the poetic epithet of Aerial or lofty cypress,* being little else than mere bushes. The camping ground is a mere depression in the bleak hill side, above the village. The water of a spring close by was 44°. Not-

* "Non sine nutanti platano, lentaque sorore
Flammati Phaethontis et *aeria cupressu*." Catullus Nup. Pel. et Thet.

withstanding the lowness of the temperature, the larvæ of some insect were numerous in it, and what seemed an aquatic acarus or tick, and a small species of leech, rather less than an inch in length. These quick-scented animals soon found out and attached themselves to some garbage of a sheep, which my servants had left in the water, and I subsequently found these animals to abound in running water both in Bissahir and Spiti. Leeches are known to be one cause of cattle epidemics, especially in excessively wet seasons, as this has been, and it would be interesting to ascertain, by the dissection of cattle which have died of epidemic disease, if they are infested internally by these rapacious creatures; as, if the disease can be traced to this cause, a remedy might easily be applied by carefully debarring the cattle from all access to streams containing them. I myself had no opportunity, as the epidemic among the cattle had occurred in the spring, and most of the survivors had been driven up the mountains to escape its effects.

29*th*, *Sangnam*.—Early in the morning I was awakened by the flight over my tent of many noisy birds, which I afterwards ascertained to be red-legged crows. These birds are social without being gregarious, and when feeding on the hill side, keep together in small companies, but without forming flocks. Their food consists of wire-worms and other insects, which they search for under stones and among tufts of grass, but they are usually very wary, and difficult to approach within range. This is evidently an instinct or caution peculiar to the bird. It cannot be attributed to the result of experience, as they have no reason to regard man as their enemy, being unmolested and rarely in their lives hearing the report of a gun. After quitting camp, commenced the ascent of the Ranang pass, 14361 feet, the ascent being gradual and easy. From the summit a fine view is obtained of the Sangnam valley and the hills across the Phanam river, on the opposite bank of which Sangnam is situated, and in the far distance the snowy peaks surrounding the Manirang pass, towering up to 21845 ft. The descent to Sangnam is very abrupt, and the river is crossed by a wooden bridge a little above the village. A good breadth of land was under cultivation along the river above the village, and beans were being gathered in, though not quite ripe. Apricots were the only fruit-trees I remarked, and their fruit was also being gathered. Flour was only five seers per rupee, or one seer dearer

than at the last village. Many of the cattle had long hair, due probably to an admixture of yàk blood, but the place is too low and hot for yàks to bear at this season, and I saw none before crossing into Spiti. Blue pigeons very numerous.

30*th*, *Thorapa*, 10548 ft.* (or Kajakajing).—The road up the valley keeps along the course of the stream, through cultivation, and sometimes descends into its bed. At the village of Rupa, the last or highest up the valley, procured fresh coolies and pushed on a few miles to the camping ground, at which is some cultivation but no village. On the valley sides, noticed in places thick beds of river shingle and boulder, sometimes 400 feet thick. Hills bare and uninteresting, little game beyond a few chakor and pigeons, but procured the skull of a snow bear shot two months previously, an old but small animal, probably a female. These brutes often attack the flocks of sheep when feeding on the mountains, and are accordingly destroyed, when they appear near villages, all the inhabitants turning out for the purpose. In general, however, the people of Bissahir and Kunawar are singularly devoid, for mountaineers, of all taste for sport, though they will occasionally beg a little powder and shot to kill birds with, but very rarely. At the camping ground the wild or scentless briar with its red hips abounded, and also a wild cherry bush two or three feet high, with very palatable bright red fruit, no larger than large currants. Apricot trees were also common, but the fruit, though plentiful, was very small and unripe.

31*st*, *Sando*, 12451 ft.*—(Pamachan of the maps.) A very severe and in places difficult march, the road sometimes a precipitous hill side, covered with loose and very slippery slates where great care was requisite to avoid dangerous falls. About half way, the path crossed a broad moraine-like talus of rocky fragments, detached by frost, as I suppose, from the high hill on the right, and as sharp and angular as though fractured the previous year, though doubtless the accumulation of ages. The last part of the road led in many places along the face of vertical crags, where a single false step was inevitable death. The footing was firm and rocky, but often so scanty as to render it necessary to hold on pretty tightly by the hands as well. Early in the day, met a number of Tartars from Spiti with a flock of goats, sheep and donkeys laden with salt on their way to Sangnam. They complained bitterly of the road, which I soon found they had ample

reason to do, and had I not seen them myself, I could never have credited the possibility of any solidungulate animal getting over places which they certainly had done, and though convinced of the fact, cannot understand *how* these donkeys get over spots which taxed a man's powers to climb. On the march saw many traces of bears, but none recent, and judged therefrom that their food chiefly consists of roots, grasses, and vegetable matters. Around the camping ground, which is a mere sheepfold in the mountains, gathered a little rhubarb, small and stringy, and along the stream and on the hill side remarked poplar trees and birches.

August 2nd, Largoo.—Glacier at the foot of the Mánirang pass. Camp 15521* feet. The road lies up the course of the stream which descends from the Mánirang pass, and is often rather difficult, from crossing piles of loose stones and coarse gravelly debris precipitated from the hills adjoining it. Snow bridges span the stream in many places at the foot of the pass, and eventually the road fairly enters on the glacier.

It requires a little reflection here to realize the fact that one is actually on a glacier, as nothing is seen around but huge piles of shingle and rocky fragments heaped up in an irregular manner, like some Brobdignagian ploughed field. Long ravines and somewhat anomalous looking pits or depressions are everywhere met with, and occasionally pools of water, which, on closer inspection, are seen to be encircled with walls of ice—not the crystal product, but a dirty looking mass embedding large stones and coarser mud and gravel, and at the surface completely covered up by rocky debris melted out of it. Pitched my tent on a small patch of green sward a few yards square, a little oasis in the midst of an Arctic Sahara. No wood was of course procurable, save a scanty supply I had brought up with me ; but in spite of the cold, I enjoyed greatly the grandeur of the scene, encircled by snowy peaks which seemed to impend over my little camp and among which the avalanches might occasionally be heard crashing and booming with a roar surpassing the heaviest artillery.

A little below the camping ground I met a European descending the pass from the North, attended by a few coolies, and we of course halted and "liquored" together and held a brief conversation as to our respective routes, game, provisions, &c., with regard to which last, he gave me to understand that I had been absurd-

ly imposed on hitherto as to the price of flour, and that every European not a fool, in Ladak, insisted on having sixty seers of flour for the rupee, a statement regarding which I had doubts, notwithstanding the local knowledge of my informant. He informed me that he was Lt. Melville, attached to the Grand Trigonometrical Survey in Kashmir, and eventually accepted the loan of a small sum of money, as his own funds were barely adequate to carry him into Simla. On my return to Simla, however, I discovered that I had been swindled, (alas for the frank Saxon physiognomy of my friend) and Lt. Melville (verus), to whom I wrote, was able to give me some particulars regarding the gentleman who had thus honoured him by assuming his name. He turned out to be a man who had been recently turned out of the Grand Trigonometrical Survey for disreputable practices, and who also, I believe, so conducted himself in Simla as to give the trades-people there a higher opinion of his talents and impudence than of his honesty. To punish the European swindler, however, who exercises his talents in the Upper Provinces is, in the present state of the law and the practical difficulties and expense attending a prosecution at the Presidency, one thousand miles away, far from easy.

3*rd*, *Camp*.—Northern foot of the Manirang pass, 15273* feet (Sopana of the Maps.) The ascent of the pass is very steep and extremely laborious, from the heaps of loose debris one is forced to climb over. The labour of climbing over this sort of ground at this height was so severe, that in one or two places I thought I should have fainted from sheer exhaustion, and once or twice rocks and mountains seemed to swim round, so that I was forced to throw myself on my back to avoid falling over the steep rocks I was at the time ascending, the result of which would have been an abrupt termination to my journey and life. On gaining the snow bed near the summit, the path was much easier, though the snow was rather slippery, and there were a few crevasses to be avoided. The summit of the pass is but a little under 19000 ft. (18859*) and the descent lies over a glacier much finer and larger than that on the south side. Both myself and servants all got severe headaches, but strange to say not till we had effected a considerable descent from the top of the pass: they remained all that evening, but left no traces the next morning. Spirits I believe only aggravate the headaches, and I contented myself after my

hard day's work with a rasher of bacon and two cups of hot coffee, before turning in for the night. The camping ground was four hundred feet below the upper limit of furze and on the opposite side of a stream issuing from the glacier, which had to be forded, a most unpleasant operation in such cold water, though not reaching much above the knees. The glacier on the north face of the pass terminated in a sheer wall of ice, from beneath which a muddy torrent was springing, and the lateral moraine over which the road descended was but little less abrupt. I crossed the Parangla pass, of nearly equal or perhaps greater height, without any headache, the ascent being much more gradual than at the Manirang, and to the excessive exertion which is called for on this pass I attribute, quite as much as to its height, the severe headaches from which all who cross it suffer.

4th, Máni.—11893 ft.*—A short march to the village whence the pass receives its name. A little way below the camping ground, passed the bluff termination of a moraine, some three miles below the spot where the glacier at present terminates. The road generally speaking is easy, over limestone rocks. Wild leeks were growing in great profusion, though I had noticed none the other side of the pass. On first entering the Spiti valley, the traveller is struck with the unexampled bareness and sterility of the hills, which are devoid of even a trace of trees and merely support a few grovelling furze shrubs on the slopes at their base. Though a result of their geological structure, it does not require much geological knowledge to be struck with the extraordinary manner on which the strata composing them are twisted about, or with their extremely sharp and serrated outline which far surpasses any examples of the kind either in India or Europe. Another marked peculiarity is the enormous heaps of angular debris of rock, which in many places cumber the ground, and clearly result from the severity of the winter frost, unmodified as to outline by rain, which, in countries within range of the monsoon, would soon disperse, or at all events greatly smooth down and outspread such heaps of loose incoherent material. This last surface peculiarity far more impresses one with the sense of desolation, and one's entire separation from the Cis-Himalayan countries, than the bare hills whose mural precipices and serrated peaks bound the landscape on every side. After a sharp descent, the village of Mani is reached, situated at a height of 11939 ft.* on a plateau of old river alluvium. The heat here during the

day was intense, and inside a tent the thermometer rose to over 100°. The temperature of the air may be taken at however about 85° at midday, sinking to 45° at sunrise, which gives a daily range of from 40 to 50 degrees. The whole scene is striking and peculiar and totally unlike anything met with in Cis-Himalayan countries; the bare and precipitous hills of a peculiar and uniform yellow colour, their sharply defined and jagged outline, the total absence of trees, save a few poplars planted about the village, amidst rich crops of wheat and barley, the square flat-topped houses, with their tiny windows, and stores of furze for winter fuel accumulated on the roofs, the yáks and shawl goats grazing among the rocks, and lastly the inhabitants themselves, genuine Tartars in physiognomy, and with their nationality stamped on every particular of their figure, dress or speech, combine to form a complete contrast with the country and people on the opposite side of the pass.

Pitched tents in a rather confined spot a little above the village, and was soon surrounded by an enquiring group of the inhabitants. Unfortunately I had no interpreter or servant who understood the language sufficiently to carry on a conversation, a want which I severely felt, as it precluding my getting information which I was often anxious to obtain.

Both men and women dress in loose coats and trousers of a coarse woollen cloth and puttoes or boots of untanned leather. These boots are very warm and substantial articles, composed of a sole of leather which is turned up all round the foot and stitched to a thick woollen stocking or legging which is tied above the knee. Though rather clumsy in appearance, these boots afford perfect protection against cold and from injury from rough ground or ice; and after a march a cooly may often be seen with a needle and thread, putting a few stitches into a weak place in his boots, which often exhibit signs of having had half a dozen soles added from time to time one over the other. The men wear either conical caps, or ones much the shape of a comfortable travelling cap, and their hair in a pigtail, except the Lamas or priests who are closely cropped. The women wear their hair braided behind in numerous small plaits, often twenty or upwards in number, sometimes tied loosely together at their ends, and sometimes kept equidistant by having their ends passed through a horizontal ribbon half way down the back, the plaits then recalling

to mind the bars of a *gridiron.* Most of the men wear necklaces of large amber beads or turquoise of very irregular shapes, but very frequently an inch or more in diameter. The amber is mostly sulphur-colored and it is by no means easy to purchase a fine necklace, as they seem to be regarded as heir-looms, and are all brought from "Maha-chin." Besides these large beads, the less affluent wear smaller ones of glass, agate or coral, though usually with a few beads of their favorite amber or turquoise intermixed. Some beads are a very clever imitation of dark onyx of Chinese manufacture, which is not readily detected, save on close examination. They are the same I believe as are met with occasionally in Hindustan, where they are called "Solimains," and are greatly prized, though none here can tell where they originally came from.* The women wear similar

* I have subsequently been able to procure a good number of these antique agate beads at Benares, and have little doubt that the whole of them are originally derived from the mounds and ruins at Bamean and other spots in the Cabul territory, where gems, beads, coins and other relics of Græco-Bactrian manufactures are found after the rains have ploughed up the soil.

The beads are of all shapes and sizes, spherical, cylindrical, fusiform or barrel shaped, and of various materials, dark agate with white bands, onyx, carnelian, jade, black schist with white bands, lapis lazuli, rock crystal, obsidian (?) blue and white porcelain, and glass and enamel of various colours. Many other sorts of stone as amethyst and bloodstone also occur, but I could not satisfy myself that these were antique, though they possibly may be. The single obsidian bead is cut as a polygon with numerous small faces, and I consider it as obsidian rather than a dark enamel, from its having been drilled, which glass or enamel beads never are, and consequently exhibit a much larger and more irregular or gaping perforation; and as obsidian occurs in Kattiawar, it might have been procured.

The most curious beads of all are, however, of agate or carnelian inlaid with a cream-coloured enamel. Of these I have several patterns, cylindrical, spherical, fusiform or flattened. One round bead is ornamented all over with elongate spots formed by pitting the surface of the carnelian and filling the depression with enamel. Another is ornamented with circles formed in the same way, while the fusiform beads have two narrow circles at either extremity, from which alternately five lines are carried half way down and connected round the middle of the bead by a zig-zag line, like that uniting two layers of cells in a honeycomb. Of this sort of bead I have a curious but rough imitation in enamel which is probably antique, and the same pattern is also wrought on smaller polygonal beads of dark agate. The cylinders are either carnelian or dark agate with four or five cream-coloured beads carried round them. In all these the pattern is engraved as a deep groove on the surface of the agate and then filled in, flush with the surface, with enamel, and so nicely executed are some of these beads that a good glass in well executed specimens fails to reveal the mode of manufacture save in a fractured or weather-worn part.

The better-shaped of these brown beads are largely used for studs and buttons, after being carefully rounded and polished, which last process brings out the white bands in beautiful contrast with the brown colour. This brown is sometime so intense as to be even black and is merely superficial, being probably produced by some process similar to that now in vogue in Europe, where a similar result is produced by steeping the agate in oil, which sinks into the porous bands of the stone and then boiling it in sulphuric acid which chars the oil and

ornaments, but rarely so large or fine as the men. They also wear white shell bangles imported I believe from China, though India could supply them I should imagine far cheaper, and also head lappets of cloth, extending some way down the back and ornamented with large turquoises, glass, &c. Both men and women too invariably carry a small willow-wood cup, some five inches in diameter, a flint and steel at their side, and a leathern tobacco pouch filled with the dry tobacco leaf. The Spiti pipe is of iron, about a foot and a half long, with a small shallow bowl an inch across, and a square fluted stem, half an inch broad and tapering off to a round mouthpiece, but very strong.

Dr. J. G. Gerrard accords but scant justice to these unsophisticated mountaineers, when describing their personal appearance and characteristics in the Asiatic Researches. Having passed a severe condemnation on the women for their want of personal charms, to their shortcomings in which respect they have the impudence to add want of virtue also, he proceeds to say, "The men, without any superior pretensions, have their peculiarities less out of place, but they are black, greasy and imbecile, without any noble qualities whatever,"——"such is their general character, and it will apply to the whole nation of Tibetan Tartars." No impartial traveller will admit the truth of this estimate, though in features they may be unprepossessing, if judged by a European standard, in manners coarse and unrefined, and their notions of morality very different from our own. Gerrard is, however, inconsistent with himself; for only on the previous page he accords them a certain amount of praise which he afterwards seems to overlook, but which is founded in a far more candid and philosophical spirit than his subsequent condemnation. "Strangers, especially Europeans, arriving amongst them and passing rapidly on their way, see nothing in the country or inhabitants to raise a favorable impression on their mind. They observe them in black bare-headed groups, timid, squalid and in rags, and every third person a priest, but, however unintelligible their conduct when debating in

stains the stone consequently as far as the oil has penetrated. The white bands are of course mere crystalline layers which have not absorbed any oil and remain in consequence unaffected by the acid. This art is, however, unknown at the present day, to the best of my belief, in India, and these beads are declared by all the writers I have ever questioned, to be brought from the North-West or Cabul.

an unknown dialect about supplies or the propriety of our progress (both of which are doubtful in such a territory), in their houses *we were treated with friendship and hospitality, unaccompanied with that savage feeling which protects a traveller as a guest and betrays him beyond the threshold of his sanctuary.*" And again a little further on, "The absence of female chastity is a singular commentary *to their honest and pacific conduct*, and the other social qualities of their natural society." In the above passages Gerrard himself describes them as hospitable and honest, or in other words possessed of *truth* and *generosity*, two qualities indispensable to and *a pars magna* of true nobility. It must be remembered that in Buddhist countries chastity is a virtue in very slight estimation, and breaches of it viewed in a far other light than among ourselves, and it is absurd therefore to measure the breach of it among Mongolian Buddhists by the standard prevalent amongst ourselves, but utterly unknown among them. As well might a Brahmin argue (which few are so illogical as to do,) the total moral debasement and impiety of Europeans who touch beef, repugnant as the practice is to their religious feelings. The morality or immorality of an action can only be truly estimated with reference to the habits of thought or motive with which it was committed. In Hindustan for instance, the son who shortens his parents' days by stifling his father with the mud of the sacred Ganges when stretched helpless on a sick bed, or burns his mother on her husband's bier, far from being considered in the light of a parricide, is regarded as having performed a pious and exemplary part; and the Christian prelate or Mahomedan conqueror who, out of the pure love of God, dooms heretics to the flames and the sword, is viewed by his respective co-religionists as following the strict line of duty in so doing; and it is the motives which actuated them, and not a difference or disparity of the results, which prevents our regarding such bloody-minded bigots as Mahomed or Calvin with the same detestation as we regard the sordid murderers Burke and Hare.

I cannot quit this subject without remarking on the amiable and pacific disposition of the men of Spiti, in which respect they contrast most favourably with the Hindus and Mahomedans of Hindustan. I have often heard disputes regarding provisions or the loads to be carried, argued with considerable noise and animation, but the idea

of resorting on such occasions to the filthy slaver of abuse which seems to flow spontaneously from the lips of a Hindustani, never seems to occur to them. In Hindustan, the child not long after he can stand will have acquired command of the foulest language, which it is impossible he can understand, and which he vents unchecked in presence of his father or even his female relatives; and this callous indifference is not confined in all cases to natives, as I have heard the servants of English gentlemen lavish the foulest and most abominable abuse on villagers on the slightest grounds within hearing of their masters and without reproof, though it is difficult to understand how any one possessed of refined or gentlemanly feeling can reconcile himself to, or tolerate in his servants, conduct at once so odious, despicable and unjust.

5th, Danka 12740 ft. (camp 12416 ft.)—From Main descend into the bed of the Spiti river, which is crossed a little above the village by a fine suspension bridge of considerable length. Throughout Spiti, these bridges are constructed of ropes made of birch or willow twigs. The supports are two stout cables each composed of some twelve or fifteen small ropes, stretched over rude piers on either bank at about five feet apart and firmly secured by being buried deeply beneath the stones forming the piers. Between the main cables, and about two feet below them, a third of smaller dimensions is stretched and supported by light ropes passed over the side cables; and when the bridge is in good order, a passenger treading on the central cable and supporting himself by the ones on either side, can cross a river with perfect ease and safety, far more so than over the best cane bridge of the Eastern Himalayas and Khasia hills, as the cane and bamboo of which they are constructed is far more slippery than the ropes which are used in their place throughout Spiti; when, however, out of repair and the small side ropes supporting the central cable in many places deficient, the job of crossing is trying to the nerves, and actually dangerous.

Along the course of the Spiti river are seen old river terraces or deposits of shingle and sand coarse and feebly stratified, and reaching to a height of some four hundred feet above the present river level. Behind these regular deposits, and both from beneath, and also encroaching over them, rise almost mountainous accumulations of debris precipitated by frost from the abruptly scarped limestone

cliffs bounding the valley. The height of this gravelly mass mainly depends on that of the cliff at whose base it has accumulated, but not uncommonly reaches to 1,500 or 2,000 feet above the river. This incoherent formation has in some places been denuded by atmospheric action, the scanty streams occasionally traversing it being adequate for the purpose, not to mention the former action of the Spiti river, but it is in some places cemented into a firm rock, by the percolation of water depositing calc tuff. This is the case at Danka, a place built on a mass of the consolidated debris rising abruptly 1,100 feet above the river, which by the action of the elements is worn into the most fantastic pinnacles and perfectly honey-combed with irregular cavities, produced by the falling out of huge blocks or the removal of loose earthy portions of this extremely heterogeneous mass. Gerrard in his own quaint language thus describes the place, "Danka itself is perched upon a projecting ledge of conglomerate, which the erosion of time has filed into slender spires, and the percolation of snow eaten away at their bases, till they present a group of turrets and ravines almost deceiving the senses by the effect of natural agents." The camping ground is a small grassy plot some three hundred feet beneath the village, which looks down upon it from the brow of a beetling cliff, round which were flying many blue pigeons and red-legged crows. A small stream close by contained a small species of Lymnæa (*L. truncatula*), the sole fresh water mollusk I noticed in the valley.

6*th*, *Geumal.*—Crossed the Lingti river by a small suspension bridge, about six miles from Danka to the village of Sanglang. From this to Geumal, which must be at an altitude of nearly 15,000 feet, the road ascends the steep face of the hill, over beds of limestone in which the forms of pentacrinites may be distinguished, till near the village, which is situated among some open flat valleys on dark shales and behind which the hills rise some hundred feet more. The high land on which Geumal is situated is cut into a narrow wedge by the Spiti river and a considerable feeder of the Lingti river which enters below Sanglang, and viewed from Mani has the appearance of an isolated, flattish hill, of horizontal strata, (their dip from that aspect not being seen) rising with majestic cliffs some four and a half thousand feet above the Spiti river which flows at its foot, though in reality it is merely the termination of a lofty spur of land running

down into the Spiti valley from the great boundary chain to the north; the highest peaks near Geumal attaining a height of 16,266 feet, the Spiti river but two miles from this point being about 11,600 feet.

8th, Kaja, 12,200 ft.*—Descend into the Spiti valley to Kaja, a wretched village in an arid and stony plain, but with a fair extent of cultivation along the river. Great numbers of pigeons are found in the neighbourhood. On the open plateau above half way from Genmal came on a large pitfall constructed in the centre of the path, in which in winter animals are sometimes caught, chiefly "burrel" I believe. It was a circular pit with upright sides, about 7 feet deep and 15 in diameter. A projecting rim of slates inclining upwards and inwards was carried round it, over which the earth from the pit was spread and carefully levelled, so as to give the pit the appearance of being a slight rise in the ground and prevent its being seen. An animal coming along the path, in the centre of which this was, could hardly fail to fall in; and, once in, the projecting ledge of slates rendered escape impossible.

9th, Kiba, (Gyihbar apud Cunningham and Kibber of the map) A village situated some two miles up from the mouth of the Parilanghi river, at about 13,890 feet. The road passes the village of Ki, with its pretty monastery capping a very steep and commanding hillock, and even more picturesque than Danka. The ascent to Kiba is in places difficult for quadrupeds, though the road must be bad indeed which is impracticable to the hardy and semi-caprine ponies of the valley. Kiba is prettily situated on a rocky ridge, beneath which a grassy plot affords a convenient camping ground. Near the village two piles of stones are passed, ornamented, after the usual fashion, with several rough sticks with bits of rag waving from them, and the horns of the "burrel," numbers of which are killed in winter and their horns attached as trophies to piles of stones near the village. The same piles are erected at the summit of all the passes, and welcome is the sight of these rags, fluttering from many a weather-beaten stick, to the wearied traveller, as he slowly nears the summit and catches sight of them. Nearly opposite the village of Ki (12500 ft.*) was a large pile of stones covered with inscribed slabs, which are so common in the vicinity of Spiti village. These piles of stones are some 4 feet high by 6 broad on an average, and often a hundred feet

in length. They are covered with flat slates or smooth round boulders, from 6 inches to a foot or more across, inscribed with the mystical formula "*aumi mani padme hun*," or some others which are given by Major Cunningham in his work on Ladak. The same author mentions some piles of far greater length, one of half a mile near Bazzo, and another near Le of 2,200 feet. The characters are Tibetan, or "mediæval Devanagri called Lantsha," the latter I think most frequently in Spiti, the style of execution varying extremely; the inscription being sometimes rudely scratched, at others carefully engraved with elaborate ornamentation, either in sunk or raised characters. Regarding the object of these *Manis*, Cunningham observes :—

"Does a childless man wish for a son? or a merchant about to travel hope for a safe return? Does a husbandman look for a good harvest? or a shepherd for the safety of his flock during the severity of winter? Each goes to a Lama and purchases a slate, which he deposits carefully on the village *Mani*, and returns to his home in full confidence that his prayer will be heard."

11*th*, *Camp*, *West bank of Parilanghi river*, 15,427 ft.—As Kiba is the last village in Spiti this side of the Parang pass (in the Map, Parangla, rightly Parang La, *la* being a *pass*) and the nearest village in Rupshu (Rukchu) a distance of six days' march, it became necessary to make preparations accordingly; and I started therefore with some six or eight sheep and goats, each carrying twenty pounds of "suttoo" and flour, for the use of the coolies on the way, secured in goat skin bags across their backs. This day's march was a very short one; the halting-ground a grassy spot at some height above the river and well supplied with spring water of the temperature of 61°.

A small lizard was numerous among the furze bushes, *Moeoa Sikimmensis*, and a small *lagomys* inhabited the rocks, though not numerous. Many snow partridges were seen, and I managed to run down and secure a half-fledged bird as large as a chicken. The flesh tasted strongly of the wild leek on which the birds feed. A large flock of upwards of 200 sheep and goats was also encamped here, bringing down borax, each sheep carrying over 20 pounds. Towards evening the whole flock returned from grazing on the hill side, and I watched with interest the process of securing them for the night. For this purpose, numerous hair ropes, some forty feet long, are securely pegged down in parallel

lines, to which the animals are one by one fastened by means of a loop and button they carry on their necks, the goats and sheep being tethered separately. It was pleasing to observe the docility of these animals and the readiness with which they allowed themselves to be tied up. Each of them, on being secured, lay down and was fast asleep before a second had been well secured to the next place on the rope, so that in a surprisingly short space the noise and animation produced by the return of this large flock was exchanged for the most perfect stillness. The encampment was protected from the wind by the bags of borax piled into a low wall, and guarded by several fine but savage mastiffs. By day-break the whole flock was once more in motion with its freight towards Spiti.

12*th, Camp at the foot of the Parang pass, at* 16,448 ft.—Cross the Parilanghi river, and shortly afterwards ascend the camping ground, a bleak bare valley without the smallest shrub on the bare rocks. The coolies having brought up little or no fuel, all passed an uncomfortable night, a high wind often howling up the pass with occasional sleet, and the only fuel procurable being a little dried ass's dung scattered along the road. Another large flock of goats with borax passed in the afternoon *en route* to Spiti and Kulu.

13*th, Camp, east bank of the Párá river, north of the pass, at* 16,163 ft. —The ascent to the pass is steep but far from difficult; a little snow is met with in hollows and sheltered places, but the road is free of snow to the summit. The crest of the pass is a rocky ridge of vertical limestone strata, forming a gap between high snowy peaks on either hand. From this rocky ridge one steps off on to a fine glacier, which is seen filling up the valley beneath, and which is mainly augmented by the gradual descent of lateral glaciers and ice from the high snowy peaks to the west. Few crevasses exist in this glacier, and the descent over it is gradual and easy, though there are some awkward bits of road just after quitting it, where the ground is very steep and the road creeps along the chasm that yawns between the mountain side on one hand and the glacier on the other, and which is produced by the melting of the glacier in contact with the dark warm rocks of the valley. The summit of the pass I determined by a subsequent observation to be 19,132, ft. which I believe to be very nearly correct, though Cunningham makes it only 18,502 ft. This difference of 630 ft. is the more remarkable as three heights in the Spiti valley

given by Cunningham give a mean excess of + 781 feet over my determinations, and the Chomoriri Lake also as much as + 728 over what I make it. I am not so sure that the height of the pass is so much too low, as I am that the other heights are too high; and the estimate of the pass made by gentlemen on the G. T. Survey whom I met, leads me to incline towards my own or the higher estimate: but as far as I can judge, Col. Cunningham's observations of heights as compared with mine, exhibit an increasing proportionate difference from 17,000 ft.; this difference being — for all heights above 17,000 ft. and + for those below. The Parang pass, by me made 19,132 ft., exhibiting the extreme difference of — 630 ft.; whilst Lari, at 10,845 ft., exhibits a gain of + 1,049 ft. according to Col. Cunningham. At the camping ground the Para river is already a considerable stream, spread over a wide channel in numerous small streams, some of which, however, at midday are over the knees, and the sheep and goats required to be unladen before crossing.

14*th.*—*Camp on the Para river, a few miles above the mouth of the Chomoriri valley.* Day very inelement, rain and sleet falling and new snow whitening all the peaks around. Met large flocks of sheep and goats hurrying on towards the pass. The Para river receives three considerable tributaries from the eastward, in whose valleys thick deposits of old river gravel are seen, forming steep cliffs along the river course, and fully one hundred feet thick.

15*th.*—*Camp at South end of Chomoriri Lake,* 14,272 *ft.* The temperature of the water was 56° 4′, that of the air 51° and a stiff north-easterly wind. The waters of the lake are beautifully clear and pleasant tasted, though they are stated by the natives to be unwholesome, which I think may possibly be the result of some superstition. Col. Cunningham states that the lake has "no outlet, and its waters are consequently brackish, *although not very perceptibly so to the taste.*" This question of an outlet to the lake is important, but not having read the above passage or being aware that others have stated the same thing, I did not ascertain if such was really the case. Any how I think that there can be no question that the lake has an ample outlet for its waters, though very probably not a visible one. Above Mani, a sort of small lake is found by a talus of gravel and rocky accumulation stretching across the valley and damming up the stream from the glacier; but considerable percolation is always going

on, and gives rise a little way below the obstruction to a stream as large as that above it. In like manner I believe the Chomoriri lake is relieved of its superfluous waters; at all events a gentleman conneeted with the G. T. Survey, whom I met near the mouth of the Chomoriri valley, informed me that the stream I saw entering the Para river at that spot came from the lake, and the following extracts from Col. Cunningham's work I think incontestibly prove that some outlet the lake *must* have. "On the 18th September I fixed a pole in the water which I examined twice during the day and again early the next morning; but I find no perceptible difference between *the levels of the day and night, the extra quantity of water that is supplied during the day must therefore be compensated by the greater evaporation during the heat of the day.* In the same month of the year, Dr. Gerrard could not find any water-mark above *five feet* which he consequently fixed as the limit of fluctuation, but I doubt if the rise and fall of the lake *amount to so much as one foot.*" Again, "Towards the end of May or the beginning of June, the ice breaks up and melts, and by the end of July the surface of the lake attains its highest level, which from the water-marks that I saw *cannot be more than one foot above the winter leel.*" With this estimate I fully concur, though Dr. Gerrard may have noticed rubbish and rejectamenta heaped by gales to leeward to a greater height. Now, if we consider the manner in which streams descending from snow swell during the day, several of which enter the lake, it amounts to demonstration that the lake must have an outlet of some sort, not to exhibit a greater fluctuation than might almost be accounted for in a large sheet of water by the mere force of a strong wind. Mere evaporation could never hold the balance so nicely or dispose of the vast body of water the lake must receive from the surrounding country which it drains, when the ice and snow melt over hundreds of square miles and are precipitated into it.

Col. Cunningham classes this lake with the others which constitute the old lake system of Ladak, of which the existing lakes, large and numerous as they are, form but mere remnants. Geographically perhaps this view is true, but lake Chomoriri owes its existence to very peculiar local causes, and the same climatal deficiency which has dwarfed the other lakes of Ladak and converted some of them from fresh water to salt, has paradoxically enough actually given rise

to lake Chomoriri, which a restoration of a more humid climate, such as formerly existed, would very speedily once more obliterate.

How far the theory which I have formed regarding lake Chomoriri is applicable to any of the other lakes of Ladak, I cannot say; but a glance at the map suggests such a possibility, as some of them seem to be, what I take this lake to be, a *river valley* dammed up, in consequence of changed climatal condition and a *diminished rain-fall*. In two important points, this lake differs from those which at present constitute the remnants of the old lake system of Ladak.

1*st*.—It nowhere affords any indication of having ever obtained larger dimensions than it at present occupies.

2*nd*.—Its waters, though they abound in animalculæ (*entomostraca*), do not yield a single mollusk; nor are any shells to be found in the sand and shingle along its banks, which is merely such an accumulation (often a thick one) as the mountain torrents pouring down from the neighbouring hills have spread out along its shore.

The diagram in the annexed plate will help to explain better than description how a river valley has been converted into a lake, and the peculiar configuration of the ground which has aided such a result. By this sketch it will be seen that the valley in which Chomoriri lake is situated, is, not far above where it opens into the valley of the Para river, much narrowed and constricted by hills which approach within less than a mile of each other, the valley expanding to a breadth of several miles higher up. Not far above this narrow part of the valley a large stream, which when I crossed it had two channels with water rising above the knees, enters and turning round abruptly runs into the Para river. This large stream sweeps down a large quantity of boulders and gravel which it spreads over the valley in the form of a huge bank, on the summit of which it scores ever changing channels, and which entirely shuts out all view of the lake to any person ascending from the Para river, till he has attained its summit and crossed the stream which has caused the obstruction. The rise over this bar from the Para river seemed much steeper than the descent towards the lake, which it will be seen is nothing more than the drainage of the main valley dammed up by a barrier raised by a powerful affluent stream, favoured somewhat by the configuration of the ground, but also by the inability of the recipient stream to remove that shingle swept into it by one of its feeders and

to maintain a sufficient scour to keep clear its own channel. The result is of course a lake. I am not sufficiently acquainted with the surrounding country to account for the feeder becoming more powerful than the stream into which it falls; it is evidently a result of change of climate, and it is quite certain that if a considerable body of water was again supplied to the lake, it would speedily overtop its present barrier, cut a channel through it and eventually drain itself, the only requisite being an adequate supply of water to remove the obstructions brought down by its feeders and to maintain a proper preponderance of the main stream over its tributaries. To bring about such a state of things, a change of level only is required, such as we know has repeatedly taken place, with its corresponding change in the amount of rain fall; and the same phenomenon, viz. an elevating movement, which has dwarfed the once mighty inland seas of Ladak by curtailing their supply of rain water, has in some places, owing to peculiar and local circumstances, produced precisely opposite phenomena and actually given rise to lakes where none existed before.

The bottom of the lake is in some places near the shore covered with waving patches of a long grass-like weed; but I noticed no fish, though I doubt their absence from the lake, as in the stream below it I noticed small fish, though I was unable to secure any, and in the Spiti river I observed fish in water of only 41°.

Several wild horses or kiangs inhabit the shores of the lake, usually occupying the gravelly plain spread out across its eastern end, though when alarmed they take to the hills. Burrel are I believe to be got among the hills, and I was told of a flock of *ovis ammon* which used to frequent the neighbourhood of the lake, but which was driven away some years since by an unusually severe winter and has not been seen since.

A few old geese and several flocks of goslings just commencing to fly were the only birds I saw. One large flock of goslings I noticed on the side of a high hill, and at sight of me they ascended to a much greater height than I cared to follow them to on a marsh. A few *totani* or snippets were seen in a marshy flat at the mouth of the valley, but I was disappointed at the paucity of birds, after the accounts I had heard of their abundance.

16*th*, *Korzo*, 14,450 ft.—The road lies along the west border of the

lake and crosses a small ridge jutting down to the water just before reaching Korzo. The village is a wretchedly small one, situated on the opposite side of a small feeder of the lake, on a bare rocky eminence; yet from the square castellated form of the houses, with mere slits for windows, and their quaint ornamentation by poles with streamers and bunches of yaks' hair at the end, it presents rather a picturesque appearance. On my arrival I was waited on by the headman bringing a "nuzzar" of dried apricots. He was smartly dressed according to Tibetan ideas, and had on a pair of veritable Chinese boots with thick soles and tops of handsome embroidered silk, of which he seemed proud; indeed Chinese articles are esteemed here much as Paris goods are in London.

A Kashmiri Mahomedan of a very Jewish cast of countenance acted as interpreter, though not very fluently, and I soon found that provisions were very scarce and dear. The day was remarkably fine, quite a contrast to the weather of the last few days, and I should have been glad to have devoted a fortnight to the examination of the neighbourhood of the lake, but the great difficulty of procuring supplies and the appearance of the mountains, which during the last few days had become sheeted with snow far and wide, coupled with a warning I received that in so severe a season as the present has been the Parang Pass might any day become closed for laden coolies, determined me to hasten my departure back again towards Spiti, and accordingly I gave orders for returning on the following day. It now appeared that no fresh coolies were procurable, as the few available men of the village had been carried off by some other travellers; but the headman said the coolies whom I had brought with me, would gladly act again on my return; this, however, I found they stoutly refused to do, and they began preparing to move soon after being informed what was expected of them. In the afternoon word was brought that the Spiti coolies were moving off with their goats, and the headman, perceiving the urgent necessity of "taking action" in the matter, (though I warrant he never heard of father Daly's tactics or the Galway contract), sallied forth with some followers, and, aided by my Simla coolies, captured and brought back the runaways. Hereupon the most tremendous uproar ensued, the Spiti coolies stoutly declaring that they would not lay a finger on the baggage, and my men insisting in equally loud tones that they must

and should. Whilst the row lasted, I was reminded of that spirited passage in the Cid where the Cid's knight strikes in the Council one of the Counts of Carrion.

> "Then arose the cry of Cabra,
> Here Valencia the fair,
> There Castille and here Galicia:
> Many a war cry rent the air."

In something under an hour, however, terms were come to, and the coolies agreed to act, if firstly they were paid in advance, and secondly if the headman, in consideration of their acting in place of men he was bound to furnish, would present them with a fat sheep for dinner. Matters thus arranged, peace and good humour were restored, and the headman carried them all off to his house under pretext of hospitality, but also, I suspect, to guard against their changing their mind during the night. As I had already, in consideration of the hardship of the road, paid the coolies double the usual hire, I was somewhat at a loss to account for their unwillingness to earn an additional sum, and their preferring to return empty handed. As, however, I am not one of those ingenious theorists who solve such questions by supposing "niggers" act on principles unintelligible to other mortals, I made some enquiry and soon found a reasonable ground for their conduct. The coolies I found were furnished by the headman of Kiba who supplied them with food, but appropriated their wages himself. No wonder, therefore, the poor fellows objected to so much extra labour, from which they would reap small advantage. The traveller is powerless to remedy this, save by a small present which he may make to the men themselves, and in this case a few annas a piece, with the sheep they got at Korzo, made all happy and contented.

17*th*.—Return to former camping ground at the south end of lake.

On the march, it being a fine sunny day, captured a number of small lizards among the stony ground along the lake, *Phrynocephalus olivieri, Dum.* These animals associate together in pairs, as I usually took a male and female near each other, often under the same stone, under which when alarmed they would rush. They also form regular burrows in the ground, either under bushes or in the open plain, to a depth of 8 inches or a foot, according to the nature of the soil. The most curious point connected with these lizards is, that

they are viviporous, one female containing three fœti, though two seemed the commoner number. This departure from the plan of oviparous reproduction usual among lacertines seems intended to meet the exigencies of a severe climate, for in a region where snow sometimes falls at midsummer, eggs exposed in the usual manner would run considerable risk of having their vitality destroyed by an untoward frost. Those naturalists who adopt Darwin's theory of "natural selection," and the progressive mutation of species, will find it an interesting problem to explain (rejecting the old fashioned view of creative adaptation I have assumed above) how the oviparous progenitors in mythical times of these lizards came to adopt or acquire a viviporous organization, one problem of the many which the *new developement theory*, I should say "*Natural selection*" raises at every step. Near the camp the shores of the lake were perforated by the holes of a short-tailed rat or lemming, *Phaiomys leucurus*, Blyth. Their holes frequently were ranged in a long line against a bank and usually extended so far that all attempts to capture an animal by digging or flooding the holes with water proved fruitless. After infinite trouble, however, I managed to dig out an adult female, which on examination I found to contain six young ones the size of horse beans, three in each horn of the uterus. The total length of this specimen was 6.15 inches, of which the head was 1.30, and the tail 1.25. Colour yellowish mouse brown, merging into pale gray beneath. This colour, however, only extended to the tips of the hair, the body of each hair being dark slaty-blue only visible when the fur was thrown back; fur loose, length, three-eighths of an inch; whiskers, seven-eighths; ears rounded, medium size, rather oppressed. I subsequently got several more, mostly half-grown, by watching near their holes with a gun.

18*th*.—Camp a little below halting-place of the 15th.

19*th*, *Phalang-palra*.—A mere halting-place among loose rocks which afford shelter from the wind. A few miles from last night's camp recross the Para river, which here was in several channels, in two of which the water nearly reached to a man's hips.

20*th*, *Tatung*.—(Tratung Kongma of Cunningham). A mere halting-place close to the highest limit of furze on the west bank of the Para river, a little above where I halted on the 13th. Sleet fell dur-

ing the day, and the thermometer in my tent went down towards morning to 30.°

21*st*.—Recross the pass to camping ground in the Parilanghi river. Temperature of the air at the top of the pass 56°. Much fresh snow had fallen since first crossing it, the glare of which was very unpleasant.

22*nd*, *Kiba*.

23*rd*, *Chikim*.—Having procured fresh coolies, cross the stream separating Kiba from Chikim and devote a day to the examination of the neighbourhood. Chikim is situated in a broad valley partially cultivated and well watered. The barley crops are now either ripening or being gathered in; at Kiba they were still green in some places, but heavy in the ear.

24*th*, *Ki*, 12,500 ft.*—Halt a day here to examine the neighbourhood. The monastery adjoining is one of the most picturesque buildings I have ever seen, or rather group of buildings, perched on the summit of an isolated peak a couple of hundred feet above the plain, and protected behind by a stupendous limestone cliff, some fourteen hundred feet high.

26*th*, *Kuling*.—Cross the Spiti river four miles below Ki, where the rocky chasm through which it rushes like an arrow, is spanned by a bridge formed of two trees, on which are laid wicker hurdles which, though rather shaky, will support a horse or yak.

27*th*, *Chang*, 11,568 ft.*—A tedious march, road in parts very steep and bad. In the small stream flowing into the Spiti river below Kuling, found a species of Limnæa adhering beneath stones, the same as noticed at Danka; and near the camp, among river rejectamenta, a *pupa* and a couple of *helices*,* small but very abundant. These are the only land mollusca noticed in the valley, but they were nowhere found in a living state. In a small feeder of the Spiti near the camp saw some small fish, long and eel-like, sheltering under stones, but could not capture any. Temperature of water 43°.

29*th*, *Mikim*, 11,762 ft.* A rather pretty village situated on the west bank of the Pin river, a little better than eight miles from its mouth.

30*th*, *Muth*, 12,306 ft.*—(*Mud* of Cunningham). Cross the Pin river a little below Mikim. Like all rivers flowing from glaciers, this

* Pupa muscorum, Helix fulva, H. pulchella.

should be crossed early in the day, as in the afternoon the melting of the snow raises it to a dangerous height. I crossed on a pony about 8 A. M., and the water was then up to the coolies' hips, and so powerful the current that a single man could barely stem it; the plan adopted being for all to join hands and force their way over in a body. A gentleman who crossed the day before had been separated all night from his baggage, owing to the men delaying to cross with him and being subsequently prevented following by the rapid rise of the river as the day advanced;—an unpleasant accident to happen anywhere, but particularly unfortunate in such an inhospitable region as Spiti. At the village of Tiling, three miles from Muth, noticed a large number of Ibex horns, which I have nowhere else seen in the valley, "burrel" horns being those commonly met with. Camping ground on the opposite side of the stream from the village, opposite which there is a wretched suspension bridge.

31*st*, *Balair*, 13,225 ft.*—A mere halting-place, eight miles from the crest of the Tári or Bába pass. Near Balair passed large flocks of sheep and goats driven up here for pasturage, which is very luxuriant. I purchased one very fine ram of the Hunia breed of sheep with a fine pair of horns for four rupees. It was amusing to see how he sent my men reeling like ninepins, when they attempted to separate him from his fellows; but when my sheep came up, he suffered himself to be led along with them easily enough. Notwithstanding his size and fine horns, he proved to be little more than four years old, if so much. As I only required his skull, I gave the body to the coolies, who were more pleased than if I had given them a sheep with greater pretensions to edibility. The blood was carefully collected and cooked into a sort of pudding, but the headman first dipped his fore finger into it whilst still reeking, and flipped a little into the air and over the stones three or four times, muttering a short prayer whilst doing so. This I presume was a sort of expiation, or lustration for the act of shedding blood, which is theoretically a crime according to Buddhist notions. Among the loose rocks round the camp, shot several specimens, with feet furred to the toes, of *Lagomys Roylei*, Ogilvie. Though not rare here, I saw none south of the pass, though the ground was very favorable for them; and I conclude they do not range south of the Spiti valley. In a stream crossed in this march, collected many *diatoms*.

1*st September, Camp, south of Bába pass* 12,793 ft.*

The ascent to the Bába pass is far from difficult, though a large glacier descends from the summit. This glacier is fissured by numerous crevasses stretching nearly across it, and at short intervals from one another. Few of these crevasses are so broad as to be impassable, but in order to select the best spots for crossing, the road winds considerably, and it would be decidedly difficult to cross without a guide who knew the track. The day before I crossed much new snow had fallen, which made the walking rather laborious and from its dazzling whiteness proved very annoying, though not to the extent to necessitate the use of a veil, though travellers would do well always to provide themselves with this article or a good pair of tinted spectacles or eyeshades.

On the southern descent of the pass a small glacier was crossed, but a very inconsiderable one compared with that to the north. The descent was extremely steep, far more so than on the opposite side, and soon brought me to the region of birches and verdure, the encamping ground being a rather straitened plot on the hill side covered with a rank crop of grass, wild flowers, and ferns.

2*nd, Camp on east bank of the Wangur river, at Umpti* 9,317 ft.*—There is no village here, but a mere camping ground in a fine forest of pines. This day's march appeared much longer than the map shows it to have been. The whole of the Wangur valley is remarkably picturesque, the central portion being well wooded with pines, oaks, birches, &c., whilst on either side rise up steep mountains terminating in snowy peaks and glaciers, and in many places scarped into precipices of the grandest dimensions. One of these magnificent precipices opposite the camp exhibited a sheer wall of rock springing from the Wangur river to a perpendicular height of three thousand feet, unquestionably the most majestic scarp I have ever beheld.

3*rd, Wangtu Bridge.*—At the village of Yangpa, some few miles below camping place, changed my Pin coolies, who from this return to Muth. About Yangpa, apricot, peach and walnut trees were flourishing in abundance, and in front of a wooden temple two trees very like fine elms. Some way below Yangpa the Wangur river is crossed by a timber bridge, after which the road keeps along its west bank to Wangtu. This portion of the road is steep and difficult, ascending and descending most precipitous rocks and is quite impassable

for any quadruped larger than a goat. In one spot the road crosses a highly inclined slippery surface of gneiss, on which a footing is impossible, but small holes have been drilled at intervals in the rock in which one can place one's toes whilst others above support the fingers, and by their means a passage across is effected. Ascending this place is comparatively easy, but to descend requires some nerve, as in going down all the danger of the spot is clearly discerned, to say nothing of the greater actual difficulty of descending than ascending a difficult slippery incline, where a single slip is annihilation.

The last descent to Wangtu is excessively steep and difficult, from the precarious footpath being to a great extent concealed by long grass, which greatly impedes walking over such ground, and on this account some of my coolies did not reach Wangtu till after nightfall. Luckily met here a large company of grain merchants conveying wheat into the interior, from whom my coolies purchased some flour, of which their supply was completely exhausted; and there being no village here, I was at first sadly afraid, before meeting these men, that my coolies after their hard day's work would have had to pass the night supperless.

In the book at this bungalow I noticed several complaints from travellers regarding the difficulty of getting coolies and the impudence of the man who had to supply them. No doubt the charges were well founded, but there are some people who seem to suppose that all natives, official and others, should always bestir themselves with alacrity for the mere pleasure and glory of so doing, and my own experience goes to prove that in places where delay is to be anticipated from any cause, a small present coupled with a few civil words is all that is required to obtain anything that is obtainable. Men, accustomed to deal with European travellers along this road soon distinguish for whom they are working, and if they find the new arrival a close fisted individual, they are liable of course, naturally enough, not to exert themselves as they otherwise might. Travellers are too apt to forget, when they arrive perhaps in the middle of the day and want a fresh relay of coolies, that at such a time all the villagers around are scattered in the fields at work and cannot easily be gathered together. I myself experienced no difficulty or incivility at this bungalow, wherefore I have been induced to offer the above remarks.

4th, Painda bungalow 6,354 ft.*—Made a forced march to this bungalow which is a comfortable one on the line of uncompleted new road, but not quite finished. Felt quite jolly at being once more under a comfortable roof, instead of a dripping tent.

5th, Sáraon bungalow 6,632 ft.*—Made a forced march into Sáraon. In the woods near Sáraon hazel nuts were plentiful, and many of them ripe and falling from the trees.

I put up for the night in a large well built room, probably intended for labourers employed on the bridge or road, the only drawback being a few fleas which occupy such situations. The building stands in what evidently once formed the gorge of the Sutlej, before the river had cut its present deep channel a little to the north; though during floods possibly the superfluous waters may still find an exit down this channel. At present, however, it is used as a camping ground for the flocks of sheep which convey grain into the interior, and the whole is clothed with a thick crop of "Batu" dropped by passing grain merchants or travellers, and which flourishes luxuriantly in this moist well manured spot. After my hard march I slept soundly, aided perhaps by the subdued murmurs which reverberated among the rocks from the surging river below.

4th, Painda bungalow, 6,354 ft.*—Before breakfast strolled out and shot several blue pigeons which abound on the precipitous rocks which line the Sutlej here. Large lizards, (*laudakia melanura ?*) also abound among the rocks, to the crevices of which they retreat when frightened. They seem to attain their largest size at a height of 4000 or 5000 ft., occurring much smaller at Simla than at lower elevations along the road. Their abdominal cavity usually contains a great number of entozoa lying freely among the viscera, probably the undeveloped or couchant stage of some tænia, whose perfect form must be sought for in the viscera of some carnivorous bird or mammal.

6th, Dhurni bungalow, 9,275 ft.*—This bungalow is situated on the crest of a ridge, and the road is carried over a very sharp ascent, with little attempt to preserve a uniform gradient. In the village just below walnuts were being gathered and peaches covered the trees in profusion, but mostly small and unripe. *Limax altivagus, mihi,* was also common in the early morning, its traces being numerous, though I noticed none of the animals during the day.

In front of the bungalow was a large piece of ground under pota-

toe cultivation, of which long untasted vegetable I made free to dig up a few pounds. This must be near the highest limit at which they will thrive, and they certainly could not compare with the potatoes of Kursiang (Darjiling) or Cherra, though it was too early to obtain them of their full size. I do not know if the seed potatoes are cut up in the hills or planted whole, as is invariably the case in the plains, a plan which would account for the smallness of the tubers, independently of other causes affecting the plant.

7th, Nogri bungalow, 4,355 ft.*—Road descends sharply to a feeder of the Sutlej, on the banks of which the bungalow is situated in a narrow picturesque valley, but not, I should be afraid, above the region of malaria. On the way down witnessed the rude way in which sheep are sometimes shorn here. The unfortunate animal I saw, when being operated on, was firmly secured on his side by a rope round his horns, the other end of which was secured to a peg driven into the ground, his hind legs were in like manner pulled out taught, and fastened to another peg, so as to prevent much flinching, whilst his owner was leisurely carving off his wool in short strips by means of a small cheese knife, or a knife of precisely that shape. Up the valley chakor were numerous, but I saw no other game.

8th, Bowli bungalow, 7,709 ft.*—A steep ascent to the bungalow, which is situated on the ridge opposite to that on which Dhurni bungalow is built. This bungalow has an evil repute for fleas, but seemed to have just been cleaned when I used it, and I was not consequently troubled with bed-fellows.

9th, Sungri bungalow, 8,356 ft.*—An extremely good and pretty road, rising slightly to the bungalow. In the morning was awakened by the noise made by the koklas pheasants in the brushwood close by; but so thick was the vegetation that I could not catch a glimpse of a bird. Monal are also common about here, and I purchased a couple of fine skins well prepared by a shikaree.

10th, Bághi bungalow, 8,591 ft.*—Two short stages, amounting to about sixteen miles, passing the Kandála bungalow half way; road excellent and country open and rather pretty. Noticed a swarm of wild bees in a hole in a clay bank, or rather beside a large block of stone embedded in the bank, but only a small chink for entrance. Such a situation is I suspect unusual, and strange to say I have noticed no wild bees' combs on the rocks adjoining the Sutlej, though

they would certainly be found in such spots in the plains. I once, however, found near the Son a small comb on the under surface of a stone little more than a foot square, which was propped up against another resting on the ground and exposed to be trodden on by men or animals. The only place where I noticed tame bees was a village below Yangpa, in which a large well built house contained an immense number of hives ranged in the walls, small openings being made for their entrance in the timbers of which the house was partially constructed. This house must have contained close on fifty hives. The owner being absent, I could neither taste the honey nor ascertain the mode of hiving the bees, but it is probably similar to that practised in Kashmir, where it is a very usual thing for a house to have a dozen hives in the wall, each consisting of an earthen pot or cylinder contained in a small chamber in the wall with but a small external opening for the egress of the bees, but closed internally by a cover luted on, through which the honey is removed after the bees are stupified by smoke.

11*th*, *Narkanda bungalow*.

12*th*, *Matiana bungalow*.

13*th*, *Fágu bungalow*.

14*th*, *Simla* (*Hawthorne cottage* (6,579 ft., mean of 5 Obs.)—The most remarkable feature of interest I noticed on my return was the appearance presented by the cedars. On quitting Simla, the most conspicuous cones were those on the female trees, of a large size and a bright apple green, but now the male trees were covered with great numbers of small cones not a fifth of the dimensions of the others, but prominent from their immense numbers on the trees, and the copious clouds of pollen that they were discharging. The advent of autumn was also marked by the absence of numerous familiar flowers and ferns, fit and beautiful emblems of man and his short-lived destiny.

"Οἵη περ φύλλων γενεὴ τοίη δέ καὶ ἀνδρῶν·
Φύλλα τὰ μὲν τ' ἄνεμος χαμάδις χέει, ἄλλα δὲ θ' ὕλη
Τηλεθόωσα φύει ἔαρος δ' ἐπιγίγνεται ὥρη·
Ὡ^ς ἀνδρῶν γενεὴ, ἡ μὲν φύει ἡ δ' ἀπολήγει."—Hom. Il. VI.

Which same idea Crabbe thus paraphrases and enlarges in his Parish Register:

"Yes, he is gone, and we are going all,
Like flowers we wither and like leaves we fall.

Here with an infant joyful sponsors come,
Then bear the new-made Christian to its home;
A few short years, and we behold him stand
To ask a blessing with his bride in hand;
A few still, seeming shorter, and we hear
His widow weeping over her husband's bier;
Thus, as the months succeed, shall infants take
Their names, while parents them and us forsake;
Thus brides again and bridegrooms blithe shall kneel
By love or law compelled their vows to seal;
Ere I again or one like me explore
These simple annals of the village poor."

On the whole, though reaching Simla proved a grateful change to the hard fare and vicissitudes of hill travelling, I did not now experience the same buoyant feelings of pleasure as on my first visit in early summer, and it was with less regret, therefore, that I commenced immediate preparations for quitting pleasant friends and a fine climate and once more devoting myself to routine pursuits in the plains.

Notices of works connected with Sanskrit Literature.

The Bháminí Vilása of Paṇḍitarája Jagannátha, edited by Paṇḍit Jadu Náth Tarkaratna.

Calcutta, 1862.

This is an edition of one of the modern Sanskrit poets, whose works are very scarce and consequently but little known. Like the modern Latin poets of Europe, Paṇḍitarája Jagannáth has but a reflected beauty,—he feels only at second hand; still he has considerable elegance of style and occasionally even some originality of thought. Dr. Aufrecht, in his Catalogue, would fix his date as late as the emperor Akber, but we know not on what grounds. The only personal allusion in the poems themselves is in the last stanza but one.

"I have read all the Sástras and performed all the necessary rites, and my early days were spent under the branch of the hand of Dehli's lord, but now I have changed my dwelling place and worship Hari in Mathurá; I have achieved all superhuman tasks, the ornament of the assembly of pre-eminent paṇḍits."

The work has been edited from some MSS in the Asiatic Society's Library and that of the Sanskrit College. It consists of four sections; the first contains a number of allegorical stanzas on various moral subjects, the second a series of amatory commonplaces, the third an elegy on the death of a wife,* and the fourth a number of stanzas in praise of Krishna and final liberation. The editor has added a useful commentary to explain any obscure allusions or unusual words—the latter being not unfrequent.† The first book is much the most interesting, and some of the verses might remind one of the later epigrams of the Greek Anthology. We subjoin two as specimens.

"When I am dry, and overhead the summer's fiercest splendours burn,
To whom for succour in the drought will the faint troops of travellers turn?"
To whom indeed? Oh generous lake beside the highway, on thee be
My choicest blessing, but my curse upon the salt and niggard sea.‡

The next re-echoes something of the bitter experience in Dante's lines, "tu proverai," &c., or Johnson's "the patron and the jail."

Unforced to watch another's door, and sue in vain with suppliant knees
To win a patron's churlish dole,—merrily live the jocund trees!§

E. B. C.

* This elegy was printed by Bohlen as an appendix to his edition of the Ṛitusanhára.

† Some, as the frequent मिल्लिन्द, 'a bee,' are, we believe, not found in any dictionary.

‡ याते मय्यचिरान्निदाघमिहिरज्वालाभृतैः शुष्कताम्
गन्ता कं प्रति पान्थसन्ततिरसौ सन्तापमालाकुला ।
एवं यस्य निरन्तराधिपटलैर्नित्यं वपुः क्षीयते
धन्यं जीवनमस्य मार्गसरसो धिग् वारिधीनां जनुः ॥

§ परोपसर्पणानन्तचिन्तानलशिखाशतैः ।
क्षुभितान्तःकरणाः साधु जीवन्ति पादपाः ॥

Literary Intelligence, Correspondence, &c.

Dr. Sprenger writes in a letter to the President, dated Wabern, 1st October, 1862.

"The Philologen Versammlung at Augsburg was again well attended, particularly by Vienna Orientalists; I had expected Raverty would come, and was disappointed not to find him there. Some interesting papers were read, on Himyaritic and Sinaitic Inscriptions, on the present state of Turkey, on Egyptian Archæology, on Babylonian Antiquities, &c. These meetings are rather riotous, and for this reason, fatiguing, but very useful for restoring the harmony which literary quarrels have disturbed in the course of the year.

"I wish Mr. Thomas might succeed in obtaining the Tabakáti Násiry from Lady Elliot. It is a very important book. Should you not succeed and feel inclined to publish a Persian text, you might choose extracts from Ways wa Rámyn, of which the only copy known to me is in your Library. On this interesting work see Ouseley, p. 45, Hajy Khalyfu, No. 14318, and my Catalogue of Oudh, p. 338. As your MS. is defective, you cannot give the whole work, nor is it desirable, but you could fill two fasciculi with extracts.

"I am just now engaged in collecting notes on the history of Geography among the Arabs. Dr. Peschel, the Editor of the Ausland, prepares a work on the History of Geography for the press, and the portion of his labour which refers to the knowledge of the Arabs of the Southern Seas, he intends to write in the form of letters addressed to your servant with a view that I might add notes. This proceeding appears to me rather cruel towards me, inasmuch as I should be obliged to enter deeply into a subject on which we shall probably never come to clear results; I therefore prefer to send him as many notices as I can find, and to leave him the responsibility of the use he may make of them, and the conclusions he may draw from them.

"Of literary news I only heard that Wüstenfeld, who intends publishing the large Geograph. Dict. of Yaqut, finds great difficulties in establishing a good text for want of good MSS. When I left India, I

was told a copy was for sale at Lucknow. I tried in vain to get hold of it. If it is to be found it would be worth while to purchase it (the price then named was 100 rupees) and to send it to Wüstenfeld, who, if the opportunity was offered to him, would no doubt be glad to buy it himself.

"Mr. De Goeje of Leiden is preparing an edition of the Geography of Abu Zayd Balkhy and of that of Ibn Hauqal. He farther intends to edit the Asás albiláġha اساس البلاغة of Zamakhsháry. The latter work I consider as useless, or rather worse than useless, but the former two will be a very useful addition not only to eastern geography, but also to our knowledge of the state of civilization of the empire of the Khalifs.

"Should you not like to undertake a poetical work in Persian, I would recommend you the Ayeen Akbaree. It is one of the most valuable historical records we possess. I am aware of the difficulties which will attend the editing it. There is probably not one copy to be found which contains all the tables. Your best plan will be to collect all the MSS. you can find, to collate them and to make a new copy, as perfect as your materials will allow, with all the variants of importance, and if you are unable to give a perfect text, to restore it as far as it is in your power,—you might possibly get MSS. from the India House. If not, I dare say Mr. Wright would compare your MS. with those found in England. Sir H. Elliot had the intention of translating it, and he prepared a copy for this purpose. Mr. Thomas might possibly get it for the sake of its being compared. Whatever the result of your endeavours may be, thus much is certain, no one will be able to do as much as your Society."

Capt. E. Smyth writes from Camp Srinugur, Gurhwal, November 20th, 1862.

"I crossed the Niti pass into Gurhwal on the 21st October. It was tolerably cold before I left, but not so cold as last year. One day the thermometer was at 8° at sunset and the same next morning. (It probably went down to zero during the night.) Last year it sank below zero on several occasions. I crossed the Johar pass into Thibet on the 15th September. I was benighted and had to bivouac without

tent or fire-wood near the top of the pass. When I awoke next morning at two, I found myself covered with snow, as it had snowed all night, but I did not feel the cold in the slightest, being wrapped in a suit of Canadian furs I had sent to me from England. I met about twenty Tartars at the foot of the pass on the Thibet side. I had made no secret of my intention of going from here forty or fifty miles eastward to our district of Byause, then re-crossing the Byause pass into Thibet and going eighty miles westward through Thibet to the Niti pass. These Tartars had accordingly been sent to stop me, so next day, I halted and shot four fat burral, and gave them one. When they had eaten it, I sent for them, and after a good deal of talking and tobacco smoking I had it all arranged to my satisfaction. I could have forced them easily enough, but it was better policy to manage the thing peaceably. At Byause, I received your last letter containing a list of desiderata for the museum from Mr. Blyth. I have had very little sporting since I received your note, but I have managed to procure a few of the things mentioned in the list, and will send them on my arrival at Almorah after the Bagesur fair in January, and I will at the same time send your birds, and as many more as I can procure between now and then.

From Niti I crossed a very high and seldom used pass between Niti and Budrinath. It is about 18,000 feet and being within reach of the rainy season, there is much more snow and glacier than on the passes leading into Thibet. We mistook our way and had to bivouac on some rocks close to the top of the pass without food, water or fire-wood, and where there was not room to lie down, on the face of a sheer precipice. Here we had to remain squatted until 10 A. M. next day when the sun made its appearance, as the rocks were too cold to touch with our hands. The thermometer all night and until 10 A. M. next day remained at 10°. I had only two loads with me. I did not feel the cold at all, and slept all night in a sitting posture, but all the men with me I am sorry to say suffered. Some were sick all night, and three men had their feet frost-bitten more or less, only one at all severely. This was on 1st November, which is very late for crossing a high glacier pass. No European had ever crossed the pass before.

If the Government allow Stewart and me to go, I will send you a sketch of the plan by which I propose to reach Lhassa. We may per-

haps fail, but if we do, no harm will be done, and we can then return to our appointments.

I do not remember whether I have ever told you that an immense quantity of the villainous stuff called brick tea is sent from Lhassa to the Gurtokh authorities, which is forcibly sold to the people, who are obliged to take much more even than they can consume themselves; and our Bhootiah traders find that they are obliged to take the surplus in exchange for their wares.

Until this system is stopped, there will be never any great demand for our hill tea.

This should be one of our objects if we go to Lhassa."

The following is a communication from E. Thomas, Esq. to the President, dated London, 28th December, 1862.

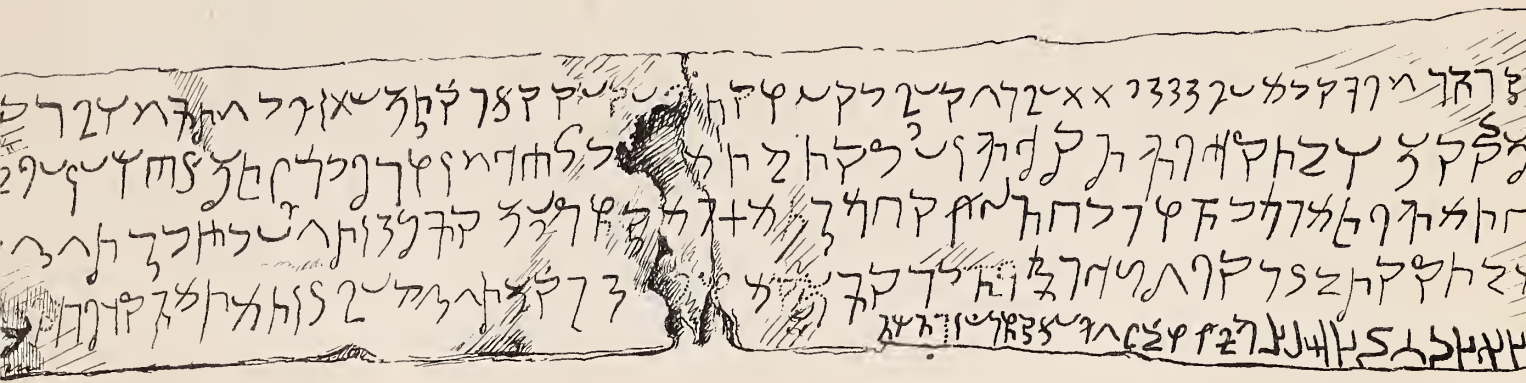
I send you by this mail an elaborate facsimile of the Taxila Inscription, alluded to in my note p. 108, Journal R. A. S. Vol. XX. a copy of which is enclosed.*

I think you may rely upon this as a faithful copy† and accept it as fit to be placed, at once, in the hands of your lithographer. The pencil lines, over which I have written in ink, formed the original transcript from the copper plate, made, through the medium of a

* "Professor Dowson has succeeded in mastering the inscription on a steatite funereal vase, preserved in the Peshawur Museum, which proves to refer to the erection of a *tope* by the Brothers Gihilena and Siha-rachhitena. And finally Mr. Norris, in concert with Mr. Dowson, is engaged on a most promising inscription from the neighbourhood of Hussun Abdal, near Rawul Pindee, in the Punjáb, presented to the R. A. S. by A. A. Roberts, Esq., C. S. regarding which, Professor Dowson has obligingly communicated to me the following notice: "The plate, which is fourteen inches long by three and a half broad, is broken in the middle, where many of the letters are lost; a connected reading of the whole cannot, therefore, be hoped for. The King's name is *Chhtrapa Siliako Kusuluko;* these words are followed by *nama*, so there can be no doubt that they form the name. After the name there are some letters obliterated, and then follow the words *Takhasilaye nagare utarena prachu deso*, which probably mean "the country north-east of Taxila." The words *Chhatrapa liako* are stamped as an endorsement on the back of the plate." I myself have not had an opportunity of examining this inscription, but I should be inclined, as a first conjecture, to identify the *Kusuluko* with some of the Kozola Kadapes family. The figured date on the plate is ××३३३, which is followed by the words *Maharaysa mahâta, &c.* (Prinsep's Essays ii. 202, 203)"

† The words *Patipasa Chatra pa Liako* are reversed in the plate as they are in the original, being indorsed on the back of the plate and shewing through reversed.

Mr A.A. Roberts' (Taxila) Plate.



LITHOG. BY H. M. SMITH, SURV. GENL'S OFFICE, CALCUTTA, FEB. 1863.

Camera lucida, by that excellent artist, Mr. Ford, as a basis for the engraving, which is designed for the pages of the forthcoming number of our home Journal. I myself have tested every letter of the Inscription and added many that were wholly illegible when the relic was first discovered.

My object in forwarding this most interesting record is, that it may be submitted to the Antiquarians in your Presidency, with a view to an independent translation being made, prior to the receipt of Professor Dowson's rendering of the text, which will probably not be published much within a month from this date. With this object of testing oriental scholarship, I abstain from all comments on the many important bearings of the document itself, though I feel bound to anticipate Professor Dowson's own announcement of his successful discovery of the value of the numerals composing the date, which even the last number of your Journal (III. 1862, p. 303) shows to be far from accomplishment by your local contributors. I must premise in order to dispel any doubts about the positive accuracy of the present interpretation, that Mr. Norris independently worked out precisely the same result on the problem involved in this inscription being submitted to him. In brief, then, the numerals employed in Arían or Bactro-Pálí Inscriptions follow an Egyptian system. Units are found to run I = 1, II = 2, III = 3, but the 4, unlike the Kapurdigiri example of IIII, is now formed by a cross, similar to a Roman X, a symbol, it is true, we do not find in any Egyptian Hieroglyphic scheme, though the five-pointed star exceptionally denoted 5. It will be seen that the Arian *eight* is formed by a duplication of the *four* in this fashion XX.

The ten is represented by a semi-circle, and, in its system of duplication, triplication, &c., proves in like manner to take after the usage of the Egyptians; though it is unquestionable that one of the less common forms of the Phœnician *ten* is expressed thus ⟩ (Gesenius p. 87), yet, to my understanding, the whole scheme seems to be based more directly upon the purely Egyptian ideal,* than upon any

* Hieroglyphic Numbers p. 402. Encylop. Metr. by R. S. Poole, Esq. and Rèvue Archéologique, p. 261, November 1862.

One 𓏤 or I

Two 𓏥 or II

derivative altered and elaborated through Phœnician influences, such as might have been anticipated to have accompanied the apparent course of the Arian letters themselves. This may be a curious question for future investigation and illustration; at present, it is sufficient to say, that the three Arian figures, similar to our English 3, constitute as a total, the sum of *six tens*, while the isolated ϙ, at the end of the row of figures, completes the number of 70, to which we have to add the eight, already noticed under the units—making the complete date of the plate the year 78.

In conclusion I may notice, that Mr. Dowson concurs in Colonel Cunningham's reading of the Macedonian months!

Four 𐤀 𐤀 𐤀 𐤀

Ten 𐤉.𐤉 — 𐤊.𐤊

These are run either 𐤍 𐤍 𐤍 𐤍 thus for 40 or thus for 𐤍 𐤍 𐤍 / 𐤍 𐤍 𐤍 } 60

𐤍 𐤍 𐤍 𐤍 / 𐤁 𐤁 } = 42

100 = 𐤑

Gesenius p. 87 Phœnician Numbers; ordinary 10 is — but, alia figura itidem *denarium* numerum designans est hæc semilunaris 𐤑 𐤑 𐤑

See also Juda's "La langue Phénicienne," p. 84.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

For November, 1862.

The Monthly General Meeting of the Asiatic Society of Bengal was held on the 5th instant.

A. Grote, Esq., President, in the chair.

The proceedings of the last meeting were read and confirmed.

Presentations were received—

1. From Lieut.-Col. J. P. Beadle through E. C. Bayley, Esq., a set of the photographs of Buildings, Monoliths, &c. in Orissa taken by the Government Photographer in Cuttack.

2. From C. A. Elliott, Esq, a copy of his work entitled—The Chronicles of Oonao, a district in Oudh.

3. From the Academy of Sciences, Hungary, several publications of the Academy.

The Council reported that they had appointed Dr. J. Fayrer to be a member of the Committee of Finance *vice* Dr. Crozier, who has gone to England.

The undermentioned gentleman was named for ballot at the next meeting:

S. Lobb, Esq., M. A. of the Presidency College, proposed by Mr. Cowell and seconded by Mr. Atkinson.

With reference to a recommendation of the Council that Mr. E. Thomas be appointed Honorary Agent of the Society in place of the late Professor H. H. Wilson, the President stated as follows:—

"The Council have asked me to obtain the assent of the Meeting to their proposition to appoint Mr. E. Thomas to be their Honorary Agent in London. I need not explain that Mr. Thomas is an old and

distinguished member of our Society, for it was only last year that the Society signified their appreciation of his reputation as a scholar and numismatist by electing him one of their Honorary members. In a recent letter I had asked him if he had any objections to my proposing to the Council his appointment as the successor of the late H. H. Wilson, and he has in reply readily assented. The post is one in which he will be in a position to be frequently of great service to us in England, and which I think it is for the interest of the Society to keep always filled. Its first incumbent, if I mistake not, was Colebrooke, who retired from it, and indeed from all literary life, under pressure of ill health in 1830. The next was H. H. Wilson, to whose active co-operation we are perhaps mainly indebted for the annual grant which was made to us more than twenty years ago by the home authorities. In now appointing Mr. Thomas, the Society will secure for itself the services of an Agent not less distinguished in his own special line of study than were Colebrooke and Wilson in theirs."

The Meeting unanimously adopted the Council's recommendation.

Communications were received—

1. From the Under-Secretary to the Government of India a memorandum received from the Bombay Government regarding Captain Speke's expedition to Eastern Africa.

The Secretary read the following extracts from the memorandum.

Writing from Kazeh on the 24th January, 1861, Captain Speke anticipated that he would be prepared to set out in a few days to explore the Northern countries, and investigate the Victoria Nyanza with the view of determining whether or not the lake was the source of the Nile, and of following down any affluents until he arrived in Egypt. Should unforeseen obstacles arise he intended to endeavour to cross the Northern extremities of the Nyanza and reach Zanzibar.

The expedition would attempt to reach the navigable Nile, the passage to Egypt appearing, from all the information which could be collected, the more easy and economical one, and the more advantageous for the future opening of the country, and this plan would only be relinquished in the event of Mr. Petheriek or any other traveller arriving at Uganda by the passage of the Nile before him.

Captain Speke, and his companion, Captain Grant, had been most hospitably received at Kazeh by Sheikh Moosa M'zari [a native of Surat] a trusted friend of the former expedition. The Sheikh actively

assisted in procuring porters, and he generously gave the expedition the services of all his servants, and with this aid Captain Speke was enabled to advance. The Sheikh would travel in company with the expedition as far as Uganda.

2. From Babu Gopi Nath Sen, Abstract of Meteorological Observations taken at the Surveyor General's Office in August last.

3. From E. Blyth, Esq., a memoir on the Rats and Mice of India.

4. From Sir Robert H. Schomburgk, a paper containing an account of a visit to Xiengmai the principal city of the Laos or Shan States.

The Secretary read the paper. It will be printed in the Journal.

Major Walker read some selections from the last report to Government, on the operations of the Trigonometrical Survey, which was submitted at the last meeting and which will be published in a forthcoming number of the Journal.

He then said that he was glad to avail himself of the recent publication of the fourth, and last, of Archdeacon Pratt's papers on the effect of Local Attraction on the operations of the Trigonometrical Survey to acknowledge the obligations of the survey to Mr. Pratt, for his theoretical investigations of this very abstruse and difficult subject. There was a time when the subject seemed likely to become one of the numerous *vexatæ quæstiones* of science. Before Mr. Pratt commenced his investigations, attempts had been made to prove that the influence of Himalayan attraction had been overlooked by Colonel Everest, and that it exists to an extent which would seriously impair the value of the Indian arc, in determining the figure of the earth. But Colonel Everest had paid considerable attention to the influence of mountain attraction in deflecting the plumb line. He had rejected one of Colonel Lambton's astronomical stations in the Madras Presidency, because of its proximity to mountains. During a visit to the Cape of Good Hope he wrote a very able paper, which attracted much attention in the scientific world, on the effects of the attraction of certain mountains, in the vicinity of the extremities of LaCaillies's arc, near Cape Town. The difference between the ellipticity of this arc, and of those measured in Europe and Russia, was sufficient to give rise to the conjecture that the figures of the Northern and Southern hemispheres were considerably different. But Colonel Everest shewed clearly that the discrepancy was probably caused by the proximity of mountains to the ends of the arc. He suggested its

extension to points where there would probably be no attraction, and he predicted that it would then give a figure coinciding with those obtained in Europe. These suggestions have been entirely verified by the subsequent remeasurement and prolongation of LaCaillies's arc by Sir Thomas MacClear, the Government Astronomer at the Cape.

Major Walker mentioned these circumstances to shew that the officers entrusted with the survey of India had not been blindly ignoring the influence of mountain attraction.

It was believed to have been avoided, in great measure, by placing the northern extremity of the arc at Kaliana, a distance of upwards of sixty miles from the Himalayas. Colonel Everest considered that the residual errors were about $5''\frac{1}{4}$ in the northern section of the arc and $3''\frac{3}{4}$ in the southern section, by which amounts he conceived the astronomical amplitude to be less than the geodesic in the upper section, and greater in the lower.

Major Walker observed that Archdeacon Pratt's early investigations shew that the Himalayas may have a far greater effect in disturbing the plumb-line than had formerly been supposed, thus raising a doubt of the scientific accuracy of the survey operations and questioning the correctness of the relative situations of places, as given in the maps. But the Archdeacon's last paper has dispelled this doubt, by proving the following elegant theorem that the length of an actual arc, measured on the surface of the earth, however altered its form may be by geological changes, is nevertheless sensibly equal to what would have been obtained had the original curvature been undisturbed; or, in other words that no possible change of curvature can disturb the normal length of the arc. Hence the relative mapping of a country is free from all error arising from local attraction. If the positions on the map are too far north or south, they will all be so to an equal degree, and consequently are relatively accurate.

The Archdeacon's investigations are further useful in establishing the fact that while the positive attraction of the Himalayas draws the plummet northwards, the negative attraction of the Indian Ocean has a similar effect. Thus, in moving from Cape Comorin to the Himalayas, the influence of the ocean diminishes, while that of the Hills increases, and hence there is a tendency to equalize the resultant attraction, at every point between the ocean, and the Himalayas. Major

Walker observed that the Archdeacon had thus rendered a second service to the survey by demonstrating the presence of an additional, but beneficial source of disturbance, tending to counteract the errors which the Himalayas acting above, would introduce into the astronomical arcs.

A vote of thanks was accorded to Major Walker for his valuable communication.

Archdeacon Pratt, who was present, said that it was gratifying to him to learn from so high an authority as the Superintendent of the Great Trigonometrical Survey himself that his investigations were considered useful. His connection with this subject had arisen from the accidental circumstance of his visiting Budraj near Dehra, ten years ago when on a tour of official duty, on which occasion Sir Andrew Waugh called his attention to the discrepancy which his predecessor had found to exist between the measured and observed lengths of the northern portions of the great arc of meridian, and asked him to turn his thoughts to the subject. The investigation is so difficult and abstruse that those only who had read his papers through would enter into it. To this he would attribute the impression which had gone abroad in some places that in his fourth and last paper in the Royal Society's Transactions he had in a measure receded from a position he had taken up in an earlier stage of the investigation; which was not at all the case. There could be no question that the deflection caused by the Himalayas at the northern extremity of the great arc is very great, about five times as great as that caused at Col. Lambton's station, which was rejected in consequence of the amount, as Major Walker has stated; and that there is a considerable deflection also at the southern extremity of the arc, arising from a cause which had never before been thought of, *viz.*, the deficiency of attracting matter in the ocean, and amounting, there was little doubt, to as much as four times the error at the rejected station. At intermediate places on the arc the effects were intermediate also. The tendency of the two causes taken together was, therefore, as Major Walker had stated to a certain degree to equalize the total error throughout the arc, that is in fact to conceal it, because the Survey brings to light only relative errors of deflection. His last paper had demonstrated by means of the theorem to which Major Walker had referred, that (inappreciably small quantities being

neglected) the distances between places determined by the survey are free from the effects of these errors of local attraction, and that a comparison of these measured distances with the latitudes found by observations of the heavens gave the correct amount by which the total local attraction (arising from whatever causes, mountains, ocean, or variations of density in the strata below) differed in passing from one place to another. It was to his having arrived at his satisfactory conclusion, that he attributed the impression which had existed in some quarters, that he had receded from some former position he had taken up. But he would add, that this result, which was so satisfactory as regarded the survey, could not have been anticipated, and could be known only by demonstration, when once the existence of the great disturbing causes he has alluded to had been brought to light. The total error by which the whole map was out of place on the terrestrial spheroid was still an unknown quantity, and was very probably as much as half a mile. The exact amount would always remain unknown, since although the effect of the Himalayas and of the ocean might be estimated in the way his papers had set forth, the effect of unknown variations of density in the strata below could not be ascertained.

The Librarian then submitted the usual monthly report.

Library.

The following is a list of the additions made to the Library since the last meeting.

Presented.

The Chronicles of Oonao, a district in Oudh, By C. A. Elliott, Esq.—By the Author.

Indische Studien, Vol. 5, Parts 2 and 3.—By Dr. Weber.

Annals of Indian Administration, Vol. VI. Part 3 for September 1862.—By the Bengal Government.

Bij dragen Tot de Taal-Land en Volkenkunde van Nederlandsch Indie, Part 4.—By the Amsterdam Institution.

Calcutta Christian Observer for October and November 1862.—By the Editors.

Paspati, A. G. Memoir on the language of the Gypsies.—By the Author.

General Report on Public Instruction in the Lower Provinces of

the Bengal Presidency for 1860-61.—By the Director of Public Instruction.

Journal of the Statistical Society of London, Vol. XX. V. Part 3 for September 1862.—By the Society.

Ditto Asiatique, Tome XIX. Nos. 75, 76 and 77 for June and July 1862.—By the Paris Asiatic Society.

Ditto of the Chemical Society, Vol. XV. Nos. 7 to 9 for July to September 1862.—By the Society.

Ditto of the Agricultural and Horticultural Society of India, Vol. XII. Part 3.—By the Society.

Ditto of the Sacred Literature and Biblical Record, Vol. II. No. 3 for October 1862.—By the Editors.

Ditto of the Royal Geographical Society, Vol. XXXI.—By the Society.

Memoirs of the Geological Survey of India, Palæontologia Indica, Vol. II. Part 3.—By the Superintendent of the Survey.

Oriental Baptist, for August and September 1862.—By the Editor.

Oriental Christian Spectator for July and August.—By the Editor.

Proceedings of the Royal Geographical Society, Vol. VI. Nos. 3 and 4.—By the Society.

Ditto of the Royal Society of London, Vol. XII. Nos. 50 and 51.—By the Society.

Quarterly Journal of the Geological Society of London, Vol. XVII. No. 71 for August 1862.—By the Society.

Annual Report on the Administration of the Coorg Districts for 1861-62.—By the Bengal Government.

Annual Report on the Administration of British Burmah for 1861-62.—By the Bengal Government.

Annual Report on the Administration of Mysore for 1861-62.—By the Bengal Government.

Report on the Administration of the Madras Presidency for 1861-62.—By the Bengal Government.

Selections from the records of the Bombay Government, No. 65.—From Public Works Department.

Veni Samhara, a drama by Bhatta Náráyana.—By Muktarama Vidyabágis'a.—By Baboo P. C. Tagore.

Zeitschrift der Deutschen Morgenländischen Gesellschaft, Vol. XVI. Part 4.—By the Society.

Prayer of St. Niersis Clayensis, translated into Bengali and Sanscrit.—By Babu Rajendralala Mitra.

Exchanged.

Athenæum for July, August and September.

The Philosophical Magazine, Vol. XXIV. Nos. 159, 160 and 161.

Purchased.

The Annals and Magazine of Natural History for August, September and October, 1862.

Abhandlungen für die Kunde des Morgenlandes—Kathá Sarit Sâgara, Vol. II. Part 5.

Abhandlungen für die Kunde de Morgenlandes Die grammatischen Schulen der Araber, Vol. II. No. 4.

Hewitson's Exotic Butterflies, being illustrations of new species, Part 44, 1862.

Journal des Savants for July, August and September, 1862.

Markham's Life of Donalonsq de Guzman.

Major on the Discovery of Australia by the Portuguese in 1601.

Numismatic Chronicle and Journal of the Numismatic Society for September, No. 7 of New Series.

Parthenon, Vol. I. Nos. 12 to 24, 1862.

Schleicher compendum der Vergleichenden grammatic der Indogermanischen Sprachen, Part 2.

Sprenger das Leben und die Lehie des Mohammad, Part 2.

Tornberg Symbolæ ad Rem Numariam Mohammedanorum, Part 4.

Revue et Magasin de Zoologie Nos. 6, 7 and 8.

Revue des Deux Mondes, from July to October, 1862.

Westminster Review for October, 1862.

Weils Geschichte, Vol. II.

Comptes Rendus, Vol. LV. Nos. 1 to 11, 1862.

Natural History Review for October, 1862.

Zenker Dictionnaire Turc-Arabe-Persan.

Benfey's Orient und occident, Vol II. Part 1.

Scheref Namah, Vol. II.

Wright's Arabic Grammar, Vol. II.

For December, 1862.

The Monthly General Meeting of the Asiatic Society was held on the 3rd instant.

A. Grote, Esq., President, in the chair.

The proceedings of the last meeting were read and confirmed.

Presentations were received—

1. From the Secretary of the Government of India, Military Department, a set of photographs and notes descriptive of the tribes of Berar.

2. From the Under-Secretary to the Government of Bengal, a complete set of photographs prepared under orders of the Bengal Government for the London Exhibition.

3. From Dr. A. G. Paspati of Constantinople, through M. J. P. Sagrandi, a copy of his work containing a "Memoir on the Language of the Gypsies."

4. From Baboo Prosunno Coomar Tagore a copy of Pundit Muktaráma Vidyábagísa's edition of the Vení Samhára Nátak.

The Council reported that they had appointed Dr. T. C. Jerdon and Mr. J. Obbard members of their body in the place of Dr. W. Crozier and Hon'ble W. Grey.

A letter from Capt. H. L. de la Chaumette, intimating his desire to withdraw from the Society, was recorded.

S. Lobb, Esq., M. A. proposed at the last meeting, was balloted for and duly elected an ordinary member.

The following gentlemen were named for ballot as ordinary members at the next meeting.

F. Fedden, Esq., Geological Survey, proposed by Mr. W. Theobald, seconded by Mr. J. G. Medlicott.

Hon'ble J. P. Norman, proposed by the President, and seconded by Lieutenant-Colonel Thuillier.

Hon'ble H. S. Maine, M. A. proposed by the President and seconded by Mr. Cowell.

M. S. Howell, Esq., C. S., proposed by E. C. Bayley, Esq., seconded by J. W. S. Wyllie, Esq.

R. A. Sterndale, Esq., proposed by Dr. T. C. Jerdon and seconded by Hon'ble C. Beadon.

J. Squire, Esq., Bengal Army, proposed by Dr. T. C. Jerdon and seconded by the President.

The Council also named for ballot at the next meeting Dr. T. Goldstucker, Professor of Sanscrit, London University, as a Corresponding Member.

Communications were received—

1. From the Under-Secretary to the Government of India, Public Works Department, forwarding copy of a letter from the Secretary to the Government of Bengal, Public Works Department containing extracts from a report by the Executive Engineer, Upper Assam, of interesting ancient works in that Province visited during 1861-62.

2. From Baboo Gopinauth Sen, abstracts of the results of the Hourly Meteorological Observations taken at the Surveyor General's office in September last.

Dr. Anderson read his paper on the Flora of Parisnath.

The thanks of the meeting were voted to him for his valuable communication.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Sea level, 18.11 Feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.779	29.849	29.712	0.137	86.9	100 0	78.2	21.8
2	.781	.851	.718	.133	85.9	96.2	78.0	18.2
3	.751	.838	.680	.158	86.8	100.8	76.2	24.6
4	.689	.769	.607	.162	84.8	93.4	77.4	16.0
5	.695	.763	.602	.161	82.7	91.6	75.0	16.6
6	.719	.798	.643	.155	83.0	94.2	74.2	20.0
7	*Sunday.*							
8	.714	.798	.625	.173	85.4	96.2	78.4	17.8
9	.694	.751	.614	.137	85.3	94.8	78.5	16.3
10	.697	.765	.621	.144	85.2	94.4	78.2	16.2
11	.688	.776	.593	.183	85.1	93.8	78.6	15.2
12	.679	.735	.611	.124	84.9	93.0	76.2	16.8
13	.667	.752	.590	.162	86.5	94.7	80.6	14.1
14	*Sunday.*							
15	.636	.698	.581	.117	87.6	97.4	82.2	15.2
16	.683	.748	.627	.121	88.1	97.8	82.2	15.6
17	.705	.782	.644	.138	88.3	98.0	81.8	16.2
18	.716	.782	.659	.123	87.6	95.8	81.4	14.4
19	.715	.780	.668	.112	86.7	95.2	82.1	13.1
20	.696	.772	.621	.151	87.6	98.2	82.6	15.6
21	*Sunday.*							
22	.690	.742	.585	.157	83.3	95.2	75.8	19.4
23	.730	.789	.671	.118	81.3	93.2	72.0	21.2
24	.769	.838	.710	.128	83.3	93.4	78.4	15.0
25	.805	.885	.756	.129	83.7	92.0	75.8	16 2
26	.787	.869	.700	.169	85.8	96.8	78.4	18.4
27	.699	.795	.609	.186	86.9	97.4	79.5	17.9
28	*Sunday.*							
29	.599	.664	.535	.129	86.0	96.0	79.4	16.6
30	.719	.821	.653	.168	86.4	96.6	75.6	21.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	78.0	8.9	73.5	13.4	0.814	8.67	4.58	0.65
2	76.1	9.8	71.2	14.7	.756	.05	.82	.63
3	75.0	11.8	69.1	17.7	.706	7.50	5.71	.57
4	77.5	7.3	73.8	11.0	.822	8.78	3.68	.71
5	76.7	6.0	73.7	9.0	.819	.80	2.92	.75
6	75.5	7.5	71.7	11.3	.768	.24	3.58	.70
7	*Sunday.*							
8	78.3	7.1	74.7	10.7	.846	9.03	.65	.71
9	78.9	6.4	75.7	9.6	.873	.32	.32	.74
10	78.6	6 6	75.3	9.9	.862	.21	.40	.73
11	77.9	7.2	74.3	10.8	.835	8.92	.65	.71
12	77.6	7.3	73.9	11.0	.824	.81	.68	.71
13	79.6	6.9	76.1	10.4	.885	9.44	.66	.72
14	*Sunday.*							
15	80.7	6.9	77.2	10.4	.916	.75	.77	.72
16	80.9	7.2	77.3	10.8	.919	.76	.96	.71
17	80.8	7.5	77.0	11.3	.910	.67	4.13	.70
18	80.5	7.1	76.9	10.7	.908	.64	3.88	.71
19	80.3	6.4	77.1	9.6	.913	.72	.46	.74
20	80.6	7.0	77.1	10.5	.913	.70	.82	.72
21	*Sunday.*							
22	76.2	7.1	72 6	10.7	.790	8.47	.46	.71
23	75.3	6.0	72.3	9.0	.783	.43	2.81	.75
24	77.7	5.6	74.9	8.4	.851	9.13	.80	.77
25	76.1	7.6	72.3	11.4	.783	8.39	3.68	.70
26	78.2	7.6	74.4	11.4	.838	.95	.88	.70
27	78.4	8.5	74.1	12.8	.830	.83	4.42	.67
28	*Sunday.*							
29	79.5	6.5	76.2	9.8	.887	9.47	3.44	.73
30	78.4	8.0	74.4	12.0	.838	8.93	4.13	.68

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.721	29.826	29.589	0.237	80.9	84.4	75.2	9.2
1	.710	.806	.581	.225	80.4	83.8	74.1	9.7
2	.701	.789	.579	.210	79.8	83.4	73.2	10.2
3	.690	.770	.575	.195	79.4	83.0	73.0	10.0
4	.696	.780	.572	.208	79.1	82.7	72.6	10.1
5	.701	.789	.587	.202	79.1	82.8	72.2	10.6
6	.724	.825	.590	.235	78.8	82.6	72.0	10.6
7	.742	.834	.609	.225	79.7	83.4	73.4	10.0
8	.764	.857	.634	.223	83.2	86.6	78.8	7.8
9	.773	.885	.624	.261	86.4	89.4	83.0	6.4
10	.778	.885	.664	.221	88.8	91.4	85.6	5.8
11	.765	.875	.641	.234	91.7	95.0	87.3	7.7
Noon.	.745	.845	.624	.221	93.7	97.8	87.7	10.1
1	.718	.823	.596	.227	94.9	100.0	86.4	13.6
2	.690	.802	.569	.233	95.1	100.8	88.6	12.2
3	.666	.779	.550	.229	94.5	100.1	86.4	13.7
4	.642	.766	.535	.231	93.0	98.0	84.8	13.2
5	.644	.756	.574	.182	90.6	95.6	84.4	11.2
6	.656	.765	.569	.196	87.4	93.2	74.6	18.6
7	.675	.776	.590	.186	85.1	91.4	77.0	14.4
8	.690	.777	.605	.172	83.6	89.6	75.8	13.8
9	.712	.800	.630	.170	82.5	88.8	75.4	13.4
10	.727	.815	.643	.172	81.9	85.4	75.0	10.4
11	.728	.838	.653	.185	81.4	85.6	75.4	10.2

The Mean Height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew point.	Dry Bulb above Dew point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	76.5	4.4	74.3	6.6	0.835	8.99	2.11	0.81
1	76.4	4.0	74.4	6.0	.838	9.04	1.90	.83
2	76.0	3.8	74.1	5.7	.830	8.96	.79	.83
3	75.8	3.6	74.0	5.4	.827	.95	.67	.84
4	75.7	3.4	74.0	5.1	.827	.95	.58	.85
5	76.1	3.0	74.6	4.5	.843	9.11	.42	.87
6	75.7	3.1	74.1	4.7	.830	8.98	.46	.86
7	76.4	3.3	74.7	5.0	.846	9.14	.58	.85
8	77.7	5.5	74.9	8.3	.851	.13	2.76	.77
9	78.9	7.5	75.1	11.3	.857	.13	3.93	.70
10	79.6	9.2	75.0	13.8	.854	.05	4.95	.65
11	80.6	11.1	75.0	16.7	.854	8.99	6.24	.59
Noon.	81.2	12.5	74.9	18.8	.851	.93	7.20	.55
1	81.3	13.6	74.5	20.4	.840	.81	.88	.53
2	81.5	13.6	74.7	20.4	.846	.86	.93	.53
3	81.2	13.3	74.5	20.0	.840	.81	.70	.53
4	80.3	12.7	73.9	19.1	.824	.67	.14	.55
5	80.0	10.6	74.7	15.9	.846	.93	5.83	.61
6	78.8	8.6	74.5	12.9	.840	.94	4.51	.67
7	78.2	6.9	74.7	10.4	.846	9.05	3.52	.72
8	77.7	5.9	74.7	8.9	.846	.06	2.97	.75
9	77.1	5.4	74.4	8.1	.838	.00	.64	.77
10	76.9	5.0	74.4	7.5	.838	.00	.44	.79
11	76.5	4.9	74.0	7.4	.827	8.91	2.36	.79

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observation, taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	141.0	..	S.	Cloudy till 6 A. M. cloudless afterwards.
2	135.2	..	S.	Cloudless.
3	144.5	..	S.	Cloudless.
4	127.8	..	S.	Cloudless till 7 A. M. Scatd. clouds afterwards.
5	128.5	0.16	S. & S. W.	Cloudy; also drizzling at 1 & 2 A. M. from 7 to 9 P. M.
6	139.0	..	S.	Cloudy till 4 A. M. cloudless afterwards.
7	*Sunday.*	..		
8	132.6	..	S.	Cloudless.
9	134.0	..	S.	Scatd. clouds till 3 A. M. cloudless afterwards.
10	130.0	..	S.	Cloudless.
11	131.4	..	S.	Cloudless till 5 A. M. Scatd. clouds afterwards.
12	126.7	..	S.	Cloudless till 9 A. M. Scatd. ⌣i till 5 P. M. cloudy afterwards.
13	136.8	..	S.	Scatd. clouds till 2 P. M. cloudless afterwards.
14	*Sunday.*	..		
15	132.0	..	S.	Scatd. clouds till 11 A. M. cloudless afterwards.
16	132.4	..	S. & S. W.	Cloudless.
17	135.4	..	S.	Cloudless till 5 P. M. Scatd. clouds afterwards.
18	130.6	..	S.	Cloudless till 7 P. M. Scatd. clouds afterwards.
19	131.2	..	S.	Scatd. clouds till 7 P. M. cloudless afterwards.
20	132.0	..	S.	Scatd. clouds.
21	*Sunday.*			
22	130.0	0.15	S.	Cloudy; also raining between 5 & 6 P. M.
23	124.6	..	S. E. & E. & S.	Cloudless till 11 A. M. cloudy till 8 P. M. cloudless afterwards, also drizzling at 3 P. M.
24	127.8	..	S. & S. E.	Scatd. clouds; also drizzling between 3 to 4 P. M.
25	126.8	..	S. & E.	Scatd. ⌣i & ⌒i till 4 P. M. cloudless afterwards, also drizzled at 1 P. M.
26	135.0	..	S.	Cloudless till 8 A. M. Scatd. ⌣i & ⌒i till 8 P. M. cloudy afterwards also drizzling betweeu 9 & 10 P. M.

\i Cirri, ⌣i Cirro strati, ⌒i Cumuli, ⌒i Cumulo strati, ⌣i Nimbi, —i Strati, ⌣i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
		Inches.		
27	127.8	..	S. & S. W.	Cloudless till 11 A. M. Scatd. clouds afterwards.
28	*Sunday.*			
29	132.0	..	S.	Cloudless till 7 A. M. Scatd. clouds afterwards.
30	135.0	..	E.	Cloudless till 10 A. M. Scatd. ⌣i & ⌢i till 5 P. M. cloudy afterwards; also slightly drizzling at 11 P. M.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ...	29.711
Max. height of the Barometer occurred at 9 & 10 A. M. on the 25th, ..	29.885
Min. height of the Barometer occurred at 4 P. M. on the 29th, ..	29.535
Extreme range of the Barometer during the month, ...	0.350
Mean of the Daily Max. Pressures, ...	29.785
Ditto ditto Min. ditto, ...	29.640
Mean daily range of the Barometer during the month, ...	0.145

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	o
Mean Dry Bulb Thermometer for the month, ...	85.6
Max. Temperature occurred at 2 P. M. on the 3rd, ...	100.8
Min. Temperature occurred at 6 A. M. on the 23rd, ...	72.0
Extreme range of the Temperature during the month, ...	28.8
Mean of the daily Max. Temperature, ...	95.6
Ditto ditto Min. ditto, ...	78.3
Mean daily range of the Temperature during the month, ..	17.3
Mean Wet Bulb Thermometer for the month,..	78.2
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	7.4
Computed Mean Dew-point for the month, ...	74.5
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	11.1

	Inches
Mean Elastic force of Vapour for the month, ...	0.840

	Troy grains
Mean Weight of Vapour for the month, ...	8.98
Additional Weight of Vapour required for complete saturation, ..	3.78
Mean degree of humidity for the month, complete saturation being unity,	0.70

	Inches
Rained 7 days, Max. fall of rain during 24 hours, ...	0.16
Total amount of rain during the month, ...	0.31
Prevailing direction of the Wind, ...	S.

Abstract of the Results of the Hourly Metcorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.					1		1		20		1						1		2
1					1		1		21		1						1		1
2					3		1		21	1	1								
3					2		2		19	1	1								2
4					2		2		14		1								7
5					3		2		18		1								2
6					4		3		19										
7			1		2		4		18		1								
8					3		3		18		1								1
9					2		3		19		1		1						
10					2		2		16		5		1						
11							2		14		8				2				
Noon.					1		1		18		4		1		1				
1					1		1		19	1	5								
2					1		2		20		2		1						
3					1		2	1	22	1			1						
4			1		1		2		18	1	2								2
5					1		4		20		1								
6					2		2		21				1	1					
7					2		2		19				3	1					
8					3		2		17		1		2	1					1
9			1		4				16		3	1	1				1		
10			1		3		1		16		2	1	1				1		1
11			1		3				17		3		1		1	1			

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.767	29.850	29.679	0.171	88.1	100.0	77.8	22.2
2	.727	.825	.610	.215	88.9	98.0	82.2	15.8
3	.656	.705	.574	.131	83.0	96.2	74.3	21.9
4	.623	.694	.530	.164	85.2	94.8	75.4	19.4
5	*Sunday.*							
6	.621	.696	.544	.152	88.4	96.6	82.6	14.0
7	.575	.633	.496	.137	88.3	95.6	83.5	12.1
8	.569	.636	.497	.139	88.1	97.0	77.6	19.4
9	.600	.685	.500	.185	80.7	91.2	72.4	18.8
10	.622	.690	.565	.125	82.8	93.2	74.2	19.0
11	.669	.729	.608	.121	85.8	96.0	78.8	17.2
12	*Sunday.*							
13	.672	.752	.584	.168	89.3	98.0	82.2	15.8
14	.649	.714	.568	.146	87.9	98.0	82.2	15.8
15	.667	.756	.587	.169	87.4	96.4	80.8	15.6
16	.708	.786	.635	.151	85.8	96.8	78 0	18.8
17	.684	.758	.590	.168	88.7	97.2	82.6	14.6
18	.680	.814	.578	.236	84.5	92.2	80.4	11.8
19	*Sunday.*							
20	.541	.603	.475	.128	83.5	91.2	79.0	12.2
21	.497	.546	.420	.126	86.9	94.2	79.8	14.4
22	.484	.539	.393	.146	86.3	90.8	82.4	8.4
23	.451	.504	.369	.135	87.2	95.8	82.4	13.4
24	.451	.497	.385	.112	86.6	93.6	81.8	11.8
25	.460	.521	.417	.104	85.0	92.7	77.6	15.1
26	*Sunday.*							
27	.595	.646	.526	.120	86.8	93.8	81.0	12.8
28	.643	.741	.574	.167	85.3	92.2	74.8	17.4
29	.661	.710	.594	.116	80.0	87.8	74.8	13.0
30	.617	.680	.533	.147	83.2	91.8	77.4	14.4
31	.590	.631	.509	.122	84.3	91.1	77.5	13.6

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	77.6	10.5	72.3	15.8	0.783	8.31	5.41	0.61
2	80.7	8.2	76.6	12.3	.899	9.54	4.50	.68
3	76.7	6.3	73.5	9.5	.814	8.72	3.10	.74
4	80.3	4.9	77.8	7.4	.934	9.99	.62	.79
5	*Sunday.*							
6	81.7	6.7	78.3	10.1	.949	10.07	3.77	.73
7	80.7	7.6	76.9	11.4	.908	9.64	4.16	.70
8	80.4	7.7	76.5	11.6	.896	.52	.20	.69
9	74.7	6.0	71.7	9.0	.768	8.28	2.76	.75
10	76.4	6.4	73.2	9.6	.806	.64	3.11	.74
11	79.2	6.6	75.9	9.9	.879	9.38	.45	.73
12	*Sunday.*							
13	81.0	8 3	76 8	12.5	.905	.57	4.64	.67
14	80.3	7.6	76.5	11.4	.896	.54	.10	.70
15	80.1	7 3	76.4	11.0	.893	.51	3.94	.71
16	78.7	7.1	75.1	10.7	.857	.13	.70	.71
17	80.7	8.0	76.7	12.0	.902	.56	4.40	.69
18	80.1	4.4	77.9	6.6	.937	10.02	2.33	.81
19	*Sunday.*							
20	78.8	4.7	76.4	7.1	.893	9.58	.42	.80
21	80.2	6.7	76.8	10.1	.905	.63	3.62	.73
22	81.0	5.3	78 3	8.0	.949	10.12	2.90	.78
23	80.8	6 4	77.6	9.6	.928	9.87	3.50	.74
24	80.8	5.8	77.9	8.7	.937	.98	.16	.76
25	80.8	4.2	78.7	6.3	.961	10.29	2.24	.82
26	*Sunday.*							
27	81.3	5.5	78.5	8 3	.935	.18	3.03	.77
28	80.2	5.1	77.6	7.7	.928	9.91	2.73	.78
29	77.5	2.5	76.2	3.8	.887	.58	1.23	.89
30	78.8	4.4	76.6	6.6	.899	.63	2.26	.81
31	80.1	4.2	78.0	6.3	.940	10.07	.21	.82

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.613	29.766	29.451	0.315	81.8	85.7	75.4	10.3
1	.609	.765	.446	.319	81.4	85.4	75.2	10.2
2	.600	.756	.438	.318	81.2	85.2	74.8	10.4
3	.596	.744	.429	.315	81.2	84.8	75.2	9.6
4	.601	.751	.421	.330	81.1	84.2	74.8	9.4
5	.610	.758	.426	.332	80.5	84.0	74.2	9.8
6	.625	.788	.414	.374	80.8	84.0	76.0	8.0
7	.644	.813	.462	.351	81.8	85.6	77.0	8.6
8	.662	.840	.487	.353	85.2	88 5	80.2	8.3
9	.667	.850	.490	.360	87.4	90.0	82.6	7.4
10	.667	.844	.492	.352	89.7	92.9	84.6	8.3
11	.656	.826	.482	.344	91.1	95.4	82.2	13.2
Noon.	.637	.811	.465	.346	92.3	96.8	82.8	14.0
1	.613	.776	.446	.330	93.0	98.6	79.4	19.2
2	.584	.743	.409	.334	93.4	99.2	78.2	21.0
3	.560	.704	.392	.312	93.4	100.0	79.2	20.8
4	.538	.679	.369	.310	91.2	98.8	80.8	18.0
5	.541	.698	.380	.318	89.3	98.8	78.8	20.0
6	.553	.725	·392	.333	87.1	94.0	78.0	16.0
7	.580	.746	.421	.325	85.0	91.4	72.4	19.0
8	.606	.747	.431	.316	84.0	89.0	74.0	15.0
9	.620	.749	.448	.301	83.0	87.8	73.8	14.0
10	.629	.790	.461	.329	82.3	86.4	75.0	11.4
11	.620	.756	.466	.290	81.7	85.6	74.8	10.8

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermomcters are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Midnight.	77.9	3.9	75.9	5.9	0.879	9.46	1.94	0.83
1	77.9	3.5	76.1	5.3	.885	.53	.74	.85
2	77.7	3.5	75.9	5.3	.879	.47	.74	.85
3	78.1	3.1	76.5	4.7	.896	.65	.56	.86
4	77.9	3.2	76.3	4.8	.890	.59	.58	.86
5	77.6	2.9	76.1	4.4	.885	.55	.43	.87
6	77.8	3.0	76.3	4.5	.890	.59	.48	.87
7	78.6	3.2	77.0	4.8	.910	.79	.61	.86
8	80.2	5.0	77.7	7.5	.931	.94	2.67	.79
9	81.0	6.4	77.8	9.6	.934	.93	3.52	.74
10	81.7	8.0	77.7	12.0	.931	.86	4.51	.69
11	81.9	9.2	77.3	13.8	.919	.70	5.27	.65
Noon.	82.3	10.0	77.3	15.0	.919	.68	.82	.63
1	82.3	10.7	76.9	16.1	.908	.54	6.27	.60
2	82.2	11.2	76.6	16.8	.899	.44	.55	.59
3	82.5	10.9	77.0	16.4	.910	.57	.42	.60
4	81.2	10.0	76.2	15.0	.887	.37	5.65	.62
5	80.9	8.4	76.7	12.6	.902	.55	4.66	.67
6	79.5	7.6	75.7	11.4	.873	.30	.03	.70
7	78.9	6.1	75.8	9.2	.876	.37	3.16	.75
8	78.6	5.4	75.9	8.1	.879	.42	2.75	.77
9	78.2	4.8	75.8	7.2	.876	.41	.41	.80
10	77.9	4.4	75.7	6.6	.873	.38	.20	.81
11	77.8	3.9	75.8	5.9	.876	.43	1.94	.83

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	139.0	...	E. & S. E. & S.	Cloudy till 3 A. M. cloudless till Noon, cloudy afterwards; also slightly drizzling at 6 P. M.
2	139.0	...	S.	Cloudless till 10 A. M. Scatd. ⌒i till 8 P. M. cloudless afterwards.
3	136.2	0.41	S. E. & S. & E.	Cloudy with rain at 1 & 2 A. M. & 4 & 6 P. M.
4	117.0	...	S. & E.	Cloudy & slightly drizzling between 9 & 11 P. M.
5	*Sunday.*	...		
6	132.0	...	S.	Cloudless till 7 A. M. Scatd. ⌒i till 3 P. M. cloudy afterwards.
7	127.0	...	S.	Scatd. clouds.
8	135.0	...	S.	Cloudy; also drizzling at 2 & 3 A. M. & 9 P. M.
9	...	0.22	S. & E. & N. W.	Cloudy with rain at 1 & 2 P. M. & also from 7 to 11 P. M.
10	124.2	0.82	S.	Cloudy with rain at 5 A. M.
11	126.4	...	W.	Cloudy till 5 A. M. cloudless till 9 A. M. Scatd. clouds till 7 P. M. cloudless afterwards; also drizzling at 6 P. M.
12	*Sunday.*	...		
13	137.0	...	S. & E. & calm.	Cloudless till 7 A. M. Scatd. clouds till 7 P. M. cloudless afterwards.
14	138.8	...	S. & S. W.	Cloudless till 7 A. M. Scatd. ⌒i till 7 P. M. cloudless afterwards; also drizzling between 5 & 6 P. M.
15	126.0	...	S. & S. E.	Cloudless till 4 A. M. Scatd. clouds afterwards; also drizzling at 11 P. M.
16	140.2	0.12	S. & S. E. & S. W.	Scatd. clouds of divers kinds; also raining at Midnight.
17	134.4	...	S.	Cloudless till 7 A. M. Scatd. ⌒i till 7 P. M. cloudy afterwards; also drizzling at 10 P. M.
18	...	...	E. & S.	Cloudy; also drizzling at 2 & 3 & 9 A. M. & also at 4 P. M.
19	*Sunday.*	...		
20	...	0.16	S. & E. & S. E.	Scatd. clouds; also raining between 10 & 11 A. M.
21	...	...	E.	Scatd. clouds.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
22	...	0.20	E. & S. E.	Scatd. ⌐i till 6 A. M. cloudy till 1 P. M Scatd. clouds afterwards; also rain between 10 & 11 A. M.
23	135.8	...	E. & S. W.	Scatd ⌉i & ⌐i till 8 A. M. Scatd. ⌒i till 4 P. M. cloudy afterwards.
24	131.0	...	S. & S. E.	Scatd. clouds.
25	...	1.60	S. & E.	Cloudy; also rain at 4 & 5 P. M.
26	*Sunday.*	0.16		
27	128.4	...	S.	Scatd. ⌐i till 1 P. M. cloudy afterwards.
28	...	...	S.	Cloudy; also rain with thunder and lightning from 8 to 11 P. M.
29	...	4.58	S. E. & E. & S.	Cloudy & raining after intervals.
30	126.8	0.68	N. W. & S. & S. W.	Cloudy; also rain from 7 to 10 P. M.
31	...	0.12	S. & S. W.	Cloudy; also rain at Noon & 1 P. M.

⌉i Cirri, ⌐i Cirro strati, ⌒i Cumuli, ~i Cumulo strati, ⌐i Nimbi, —i Strati, ⌉ i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ...	29.610
Max. height of the Barometer, occurred at 9 A. M. on the 1st, ..	29.850
Min. height of the Barometer, occurred at 4 P. M. on the 23rd, ..	29.369
Extreme range of the Barometer during the month, ...	0.481
Mean of the daily Max. Pressures, ...	29.679
Ditto ditto Min. ditto, ...	29.531
Mean daily range of the Barometer during the month, ...	0.148

	o
Mean Dry Bulb Thermometer for the month, ...	85.9
Max. Temperature occurred at 3 P. M. on the 1st, ...	100.0
Min. Temperature occurred at 7 P. M. on the 9th, ...	72.4
Extreme range of the Temperature during the month, ...	27 6
Mean of the daily Max. Temperature, ...	94.5
Ditto ditto Min. ditto, ...	79.0
Mean daily range of the Temperature during the month, ..	15.5

	o
Mean Wet Bulb Thermometer for the month, ...	79.6
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	6.3
Computed Mean Dew-point for the month, ...	76.4
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	9.5
	Inches
Mean Elastic force of Vapour for the month, ...	0.893

	Troy grains.
Mean Weight of Vapour for the month, ...	9.53
Additional Weight of Vapour required for complete saturation, ..	3.34
Mean degree of humidity for the month, complete saturation being unity,	0.74

	Inches
Rained 20 days, Max. fall of rain during 24 hours, ...	1.60
Total amount of rain during the month, ...	9.07
Prevailing direction of the Wind, ...	S. & E.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.	1	1	1	1	4		3		13				1		1				3
1	1		1	1	5	1	3		14				1		1		1		
2			1	1	5	2	2		13	1			1		1		3		1
3					4	1	3		12	1			2				2		4
4					1		1		15				2				2		6
5					5	1	2		14				3	1	1		2		
6	1		1		5	1	3		13				2		1		1		
7	2		4		3		5		11				1		1				
8					5		5		13		2		1		1				
9					6	1	3		11		5		1		1				
10					4		3		15	1	3		1		1				
11					4	1	2		12		6	1	1		1		1		
Noon.					4		4		12	1	5	1	1		1				
1	1	1	1		4		2		15	1	3				1				
2	1		2		4	1	4		12		4								
3	1		2		5		5	1	11		3								
4	1	1			5	1	5		11	1	3								2
5	1				7	1	4		13		1						1		
6	1	1			6	1	4	1	14		2	1							
7	2				5		4		10		1	1	1		2	1	2		
8	1	1			5		5		9		1	1	1		2	1	3		
9	1	1			5	1	7	1	7		1	1	1	1	2	1	3		
10	1	1			6	2	5		9		1	1			2	1	3		
11	1	1	1	1	5	1	5		8		2				1	1	3		1

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Sea level, 18.11 Feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.553	29.610	29.474	0.136	86.7	94 9	81.4	13.5
2	*Sunday.*							
3	.505	.560	.435	.125	83.9	92.4	79.6	12.8
4	.471	.517	.386	.131	81.4	86.4	79.0	7.4
5	.445	.490	.379	.111	85.7	93.3	79.8	13.5
6	.449	.505	.401	.104	84.8	91 6	78.8	12 8
7	.485	.538	.417	.121	85 5	92.4	80.3	12.1
8	.483	.529	.424	.105	86.5	91.8	83.0	8.8
9	*Sunday.*							
10	.521	.564	.473	.091	78.5	80 0	76.0	4.0
11	.532	.582	.472	.110	79.5	83.2	77.0	6.2
12	.503	.553	.445	.108	79.0	80.6	77.0	3.6
13	.368	.471	.290	.181	77.7	79.2	76.8	2.4
14	.517	.574	.444	.130	82.0	86.8	78.2	8.6
15	.537	.573	.489	.084	82.5	86.9	79.2	7.7
16	*Sunday.*							
17	.584	.659	.532	.127	78.4	80.8	76.6	4.2
18	.680	.749	.612	.137	81.1	86.0	76.4	9.6
19	.725	.779	.651	.128	84.6	89.3	81.2	8.1
20	.715	.763	.637	.126	84.4	89.4	80.8	8.6
21	.649	.698	.573	.125	84.7	89.6	81·5	8.1
22	.640	.684	.585	.099	84.2	87.6	80.8	6.8
23	*Sunday.*							
24	.717	.755	.670	.085	85.3	90.6	81.4	9.2
25	.704	.772	.608	.164	85.4	90.4	81.4	9.0
26	.662	.719	.590	.129	85.7	90.4	81.8	8.6
27	.633	.679	.565	.114	84.7	91.9	80.3	11.6
28	.606	.648	.540	.108	85.3	90.7	81.0	9.7
29	.609	.656	.553	.103	83.8	88.0	81.0	7.0
30	*Sunday.*							

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	°	°	°	°	Inches.	T. gr.	T. gr.	
1	81.5	5.2	78.9	7.8	0.967	10.30	2.88	0.78
2	*Sunday.*							
3	80.3	3.6	78.5	5.4	.955	.25	1.88	.85
4	78.9	2.5	77.6	3.8	.928	9.99	.28	.89
5	81.8	3.9	79.8	5.9	.995	10.62	2.18	.83
6	80.2	4.6	77.9	6.9	.937	.02	.44	.80
7	80.7	4.8	78.3	7.2	.949	.14	.58	.80
8	81.8	4.7	79.4	7.1	.983	.47	.63	.80
9	*Sunday.*							
10	76.4	2.1	75.3	3.2	.862	9.34	1.01	.90
11	76.7	2.8	75.3	4.2	.862	.32	.34	.87
12	77.1	1.9	76.1	2.9	.885	.57	0.93	.91
13	76.4	1.3	75.7	2.0	.873	.47	.63	.94
14	78.0	4.0	76.0	6.0	.882	.48	1.99	.83
15	78.9	3.6	77.1	5.4	.913	.82	.82	.84
16	*Sunday.*							
17	76.5	1.9	75.5	2.9	.868	.40	0.91	.91
18	78.5	2.6	77.2	3.9	.916	.87	1.30	.88
19	80.2	4.4	78.0	6.6	.940	10.05	2.34	.81
20	79.9	4.5	77.6	6.8	.928	9.93	.38	.81
21	80.0	4.7	77.6	7.1	.928	.93	.49	.80
22	79.7	4.5	77.4	6.8	.922	.87	.37	.81
23	*Sunday.*							
24	80.3	5.0	77.8	7.5	.934	.97	.67	.79
25	80.7	4.7	78.3	7.1	.949	10.14	.54	.80
26	80.9	4.8	78.5	7.2	.955	.21	.59	.80
27	79.8	4.9	77.3	7.4	.919	9.84	.58	.79
28	80.3	5.0	77.8	7.5	.934	.97	.67	.79
29	80.2	3.6	78.4	5.4	.952	10.21	1.89	.84
30	*Sunday.*							

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.591	29.754	29.443	0.311	81.4	84.4	78.6	5.8
1	.575	.741	.425	.316	81.1	83.8	78.6	5.2
2	.566	.733	.423	.310	80.6	83.6	77.4	6.2
3	.569	.721	.418	.303	80.6	83.4	76.8	6.6
4	.548	.711	.386	.325	80.0	83.6	76.6	7.0
5	.564	.721	.372	.349	80.1	83.2	76.4	6.8
6	.576	.739	.352	.387	80.1	83 6	77.0	6.6
7	.590	.747	.359	.388	80.6	84.3	76.8	7.5
8	.604	.766	.305	.461	82.0	86.2	76.0	10.2
9	.608	.779	.323	.456	83.3	89.2	76 6	12.6
10	.607	.772	.305	.467	84.4	90.8	77.0	13.8
11	.605	.765	.323	.442	85.5	91.6	77.6	14.0
Noon.	.592	.750	.332	.418	86.6	91.8	77.2	14.6
1	.573	.739	.311	.428	87.1	93.2	77.0	16.2
2	.550	.712	.290	.422	87.2	94.9	77.4	17.5
3	.528	.683	.305	.378	86.9	92.4	77.6	14 8
4	.515	.670	.310	.360	86.0	91.5	77.6	13.9
5	.520	.675	.381	.294	86.4	91.2	78.8	12.4
6	.528	.678	.358	.320	84.8	90.0	77.4	12.6
7	.549	.695	.374	.321	83.8	89.3	77.4	11.9
8	.569	.742	.420	.322	83.1	88.0	77.8	10.2
9	.590	.757	.432	.325	82.6	87.0	78.4	8.6
10	.602	.774	.446	.328	82.0	86.4	77.6	8.8
11	.600	.770	.449	.321	81.8	85.0	78.4	6.6

The Mean Height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew point.	Dry Bulb above Dew point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	78.8	2.6	77.5	3.9	0.925	9.96	1.31	0.88
1	78.7	2.4	77.5	3.6	.925	.96	.21	.89
2	78.4	2 2	77 3	3.3	.919	.92	.09	.90
3	78.4	2 2	77.3	3.3	.919	.92	.09	.90
4	78.1	1.9	77.1	2.9	.913	.86	0.95	.91
5	78.0	2.1	76.9	3 2	.908	.80	1.04	.90
6	78.2	1.9	77.2	2 9	.916	.89	0.95	.91
7	78.4	2.2	77.3	3 3	.919	.92	1.09	.90
8	78.9	3.1	77.3	4.7	.919	.88	.59	.86
9	79.4	3.9	77.4	5.9	.922	.89	2.04	.83
10	79.8	4.6	77.5	6 9	.925	.90	.41	.80
11	80.2	5.3	77.5	8.0	.925	.88	.84	.78
Noon.	80.6	6 0	77.6	9.0	.928	.89	3.25	.75
1	80 8	6.3	77.6	9.5	.928	.87	.46	.74
2	80.9	6.3	77.7	9.5	.931	.90	.47	.74
3	80.7	6.2	77.6	9.3	.928	.89	.36	.75
4	80.6	5.4	77.9	8.1	.937	10.00	2.91	.78
5	80.8	5.6	78.0	8.4	.940	.03	3.03	.77
6	80.1	4.7	77.7	7.1	.931	9.96	2.50	.80
7	79.8	4.0	77.8	6.0	.934	10.01	.09	.83
8	79.5	3.6	77.7	5.4	.931	.00	1.86	.84
9	79.2	3.4	77.5	5.1	.925	9.94	.74	.85
10	79.0	3.0	77.5	4.5	.925	.94	.53	.87
11	78.9	2.9	77.4	4.4	.922	.93	.53	.87

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observation, taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	132.5		S. & S. E.	Scatd. Clouds.
2	*Sunday.*	0.10		
3		0.78	E.	Cloudless till 4 A. M. cloudy afterwards, also rain from 2 to 9 P. M.
4		0.14	N. W. & S.	Cloudy, with rain after intervals ; also thunder & lightning between 7 & 9 P. M.
5		3.50	E. & N. W.	Cloudy, with rain from 1 to 4 A. M.
6		0.18	Variable.	Cloudy ; also drizzling at 2 A. M.
7	117.0	...	S. W. & W. & S.	Scatd. clouds till 4 P. M. cloudless afterwards.
8		0.12	S. & W.	Cloudy ; also drizzling at 6 P. M.
9	*Sunday.*	0.56		
10		0.84	S. W. & W.	Cloudy ; also constantly raining between midnight & 3 P. M.
11		0.76	S. W. & S.	Cloudy & constantly drizzling.
12		1.49	S. W.	Cloudy & constantly raining.
13		12.09	S. W. & S.	Cloudy & constantly raining.
14	122.0	...	S.	Cloudy till 5 P. M. cloudless afterwards.
15	115.5	...	S. & E.	Cloudless till 6 A. M. Scatd. clouds afterwards, also slightly drizzling between 7 & 8 P. M.
16	*Sunday.*	0.46		
17		2.71	S.	Cloudy, also constantly raining between midnight & 10 A. M.
18		1.86	S. & S. W.	Cloudy ; also constantly raining between 1 & 11 A. M.
19	125.0	...	S.	Scatd. clouds.
20	126.0	...	S.	Scatd. clouds.
21	122.0	...	S.	Cloudy.
22		0.18	S.	Cloudy with slight rain at 5 A. M.
23	*Sunday.*	...		
24	129.5		S.	Scatd. ⌣i till 5 P. M. cloudy till 8 P. M. cloudless afterwards.
25	127.4	...	S. & S. W.	Scatd. ⌣i & ⌒i.
26	124.0	0.10	S.	Scatd. clouds with slight drizzling at 1 & 6 & 8 P. M.

)i Cirri, ⌣i Cirro strati, ⌒i Cumuli, ⌒i Cumulo strati,)⌣i Nimbi, —i Strati,)⌣i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
		Inches.		
27	121.4	0.16	S.	Scatd. ⌣i & ⌢i till 8 P. M. cloudless afterwards, also slightly drizzling between 4 & 6 P. M.
28	112.0	..	S. & S. E.	Cloudless till 5 A. M. Scatd. clouds till 7 P. M. cloudless afterwards also drizzing at 3 & 5 P. M.
29		0.41	E. & N. E.	Cloudless till 5 A. M. cloudy afterwards, also constantly drizzling between 10 A. M. & 4 P. M.
30	*Sunday.*			

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ..	29.572
Max. height of the Barometer occurred at 9 A. M. on the 19th,	29.779
Min. height of the Barometer occurred at 2 P. M. on the 13th,	29.290
Extreme range of the Barometer during the month, ..	0.489
Mean of the Daily Max. Pressures,	29.625
Ditto ditto Min. ditto, ...	29.506
Mean daily range of the Barometer during the month,	0.119

	o
Mean Dry Bulb Thermometer for the month,	83.3
Max. Temperature occurred at 2 P. M. on the 1st,	94.9
Min. Temperature occurred at 8 A. M. on the 10th,	76.0
Extreme range of the Temperature during the month,	18.9
Mean of the daily Max. Temperature, ..	88.2
Ditto ditto Min. ditto, ..	79.6
Mean daily range of the Temperature during the month,	8.6
Mean Wet Bulb Thermometer for the month, ...	79.4
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,	3.9
Computed Mean Dew-point for the month, ...	77.4
Mean Dry Bulb Thermometer above computed Mean Dew-point,	5.9

	Inches
Mean Elastic force of Vapour for the month,	0.922

	Troy grains
Mean Weight of Vapour for the month,	9.89
Additional Weight of Vapour required for complete saturation,	2.04
Mean degree of humidity for the month, complete saturation being unity,	0.83

	Inches
Rained 20 days, Max. fall of rain during 24 hours,	12.09
Total amount of rain during the month,	26·44
Prevailing direction of the Wind, ..	S. & S. W.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.					2				16	2	2	1	1	1			3		1
1					3	1	2	1	16	3	2	1	1	1			1		
2					3	1	2	1	16	4	2	1	1	1			1		
3					3	1	1		14	2	3	1			1		1		2
4					3	1	1		10	2	3	2	1	1					7
5					3		2		14	3	4	1	1	1	1				
6					3		3		11	1	7	4			1				
7	1				3		2		10	1	8	4	1						
8	1		1		4		2		8	1	6	3	1		1				1
9	1		1		2		2		9	1	8	4	1		1				
10	1				5	1	1		8	1	7	4	1		2	1			
11	1						3		10	1	6	3	3	1	2	1			
	1																		
	1																		
Noon.	1				2				12		3	2	5	1	2	1			
1	1				1		1		12	2	4	2	5	2	1				
2	1	1			2	1			11	1	4		6	1	1				
3	1	1			1		2		12	2	4	1	3		2				
4	1	1			1	1			13	1	2		2	2	3		1		2
5	1				1	1			12		4	3	2				2		3
6			1		1	1	2	1	13	3	5	2	1				2		
7			1		1	1	1		16	2	4	2					2		
8					2	2	1		17	3	3	2					1		1
9			1		3	2			17		3	1			1				
10			1		3	1			17		3	2			1				
11			1		3	1			17		3	2			1				

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.560	29.598	29.499	0.099	83.5	90.4	81.0	9.4
2	.489	.546	.407	.139	82.1	85.8	80.0	5.8
3	.441	.504	.391	.113	80.2	80.8	78.8	2.0
4	.495	.555	.441	.114	82.3	85.6	79.6	6.0
5	.576	.620	.526	.094	83.5	86.2	80.0	6.2
6	.589	.632	.539	.093	84.5	87.6	82.1	5.5
7	*Sunday.*							
8	.573	.624	.515	.109	85 7	91.6	81.4	10.2
9	.569	.617	.533	.084	85.0	89.4	82.2	7.2
10	.592	.637	.529	.108	84.6	89.2	81.4	7.8
11	.579	.629	.504	.125	84.7	91.6	81.3	10.3
12	.618	.655	.584	.071	82.6	88.3	79.0	9.3
13	.639	.678	.572	.106	82.1	86.7	80.1	6.6
14	*Sunday.*							
15	.574	.631	.482	.149	83.5	88.0	79.7	8.3
16	.466	.542	.384	.158	82.2	87.0	79.4	7.6
17	.354	.422	.259	.163	82.9	87.2	80.0	7.2
18	.382	.456	.316	.140	81.4	85.0	78.8	6.2
19	.452	.511	.409	.102	81.8	85.6	79.4	6.2
20	.515	.567	.465	.102	82.3	86.8	79.8	7.0
21	*Sunday.*							
22	.472	.534	.407	.127	83.3	89.4	80.1	9.3
23	.486	.522	.429	.093	84.2	88.6	80.0	8.6
24	.517	.587	.470	.117	82.8	84.6	81.2	3.4
25	.570	.613	.526	.087	84.1	87.7	81.2	6.5
26	.591	.631	.544	.087	82.6	84.8	80.2	4.6
27	.596	.647	.538	.109	84.0	88.3	81.2	7.1
28	*Sunday.*							
29	.592	.633	.549	.084	83.8	87.6	79.8	7.8
30	.589	.617	.543	.104	80.9	83.2	78.4	4.8
31	.539	.597	.447	.150	83.7	89.0	79.0	10.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	°	°	°	°	Inches.	T. gr.	T. gr.	
1	80.3	3.2	78.7	4.8	0.961	10.31	1.69	0.86
2	79.8	2.3	78.6	3.5	.958	.30	.21	.90
3	77.9	2.3	76.7	3.5	.902	9.72	.16	.89
4	79.1	3.2	77.5	4.8	.925	.94	.64	.86
5	80.4	3.1	78.8	4.7	.964	10.34	.66	.86
6	80.8	3.7	78.9	5.6	.967	.34	2.01	.84
7	*Sunday.*							
8	81.0	4.7	78.6	7.1	.958	.23	.57	.80
9	80.7	4.3	78.5	6.5	.955	.21	.32	.82
10	80.7	3.9	78.7	5.9	.961	.29	.10	.83
11	80.6	4.1	78.5	6.2	.955	.23	.19	.82
12	79.6	3.0	78.1	4.5	.943	.12	1.56	.87
13	79.3	2.8	77.9	4.2	.937	.08	.43	.88
14	*Sunday.*							
15	79.8	3.7	77.9	5.6	.937	.04	.96	.84
16	79.3	2.9	77.8	4.4	.934	.05	.49	.87
17	79.7	3.2	78.1	4.8	.943	.12	.67	.86
18	79.3	2.1	78.2	3.2	.946	.19	.08	.90
19	79.3	2.5	78.0	3.8	.940	.11	.29	.89
20	78.9	3.4	77.2	5.1	.916	9.85	.73	.85
21	*Sunday.*							
22	79.8	3.5	78.0	5.3	.940	10.09	.84	.85
23	80.3	3.9	78.3	5.9	.949	.16	2.03	.83
24	80.0	2.8	78.6	4.2	.958	.30	1.45	.88
25	80.1	4.0	78.1	6.0	.943	.10	2.11	.83
26	79.5	3.1	77.9	4.7	.937	.06	1.62	.86
27	79.7	4.3	77.5	6.5	.925	9.90	2.27	.81
28	*Sunday.*							
29	80.2	3.6	78.4	5.4	.952	10.21	1.89	.84
30	78.3	2.6	77.0	3.9	.910	9.81	.29	.88
31	80.0	3.7	78.1	5.6	.943	10.10	.97	.84

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.546	29.631	29.341	0.290	81.6	83.3	79.2	4.1
1	.538	.648	.333	.315	81.3	83.0	79.2	3.8
2	.527	.640	.325	.315	81.1	83.0	79.2	3.8
3	.514	.638	.316	.322	80.9	83.0	79.2	3.8
4	.524	.632	.370	.262	80.9	82.6	79.2	3.4
5	.517	.643	.321	.322	80.6	82.4	79.2	3.2
6	.534	.649	.353	.296	80.7	82.4	78.8	3.6
7	.550	.658	.388	.270	81.3	83.3	79.2	4.1
8	.576	.672	.394	.278	82.9	85.4	78.8	6.6
9	.573	.673	.399	.274	84.1	86.6	79.9	6.7
10	.573	.678	.404	.274	85.0	88.0	80.8	7.2
11	.567	.670	.382	.288	85.6	90.2	80.6	9.6
Noon.	.552	.650	.374	.276	85.4	90.4	80.1	10.3
1	.537	.639	.353	.286	85.6	90.2	79.8	10.4
2	.517	.625	.335	.290	85.7	91.0	79.0	12.0
3	.500	.609	.305	.304	85.9	91.6	80.7	10.9
4	.483	.589	.263	.326	85.5	89.6	80.6	9.0
5	.482	.591	.259	.332	84.8	88.6	79.4	9.2
6	.495	.601	.285	.316	83.8	88.4	79.2	9.2
7	.510	.614	.296	.318	82.9	86.3	78.4	7.9
8	.529	.643	.313	.330	82.5	85.2	79.1	6.1
9	.547	.662	.334	.328	82.3	84.2	79.6	4.6
10	.558	.673	.351	.322	82.0	83.9	78.8	5.1
11	.559	.669	.350	.319	81.7	83.8	78.8	5.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Midnight.	79.2	2.4	78.0	3.6	0.940	10.11	1.23	0.89
1	79.1	2.2	78.0	3.3	.940	.13	.11	.90
2	79.0	2.1	77.9	3.2	.937	.10	.07	.90
3	78.9	2.0	77.9	3.0	.937	.10	.00	.91
4	78.9	2.0	77.9	3.0	.937	.10	.00	.91
5	78.7	1.9	77.7	2.9	.931	.04	0.97	.91
6	78.7	2.0	77.7	3.0	.931	.04	1.00	.91
7	79.1	2.2	78.0	3.3	.940	.13	.11	.90
8	79.7	3.2	78.1	4.8	.943	.12	.67	.86
9	80.3	3.8	78.4	5.7	.952	.19	2.02	.84
10	80.7	4.3	78.5	6.5	.955	.12	.32	.82
11	80.9	4.7	78.5	7.1	.955	.21	.55	.80
Noon.	80.9	4.5	78.6	6.8	.958	.23	.45	.81
1	80.6	5.0	78.1	7.5	.943	.06	.70	.79
2	80.8	4.9	78.3	7.4	.949	.14	.66	.79
3	81.1	4.8	78.7	7.2	.961	.26	.61	.80
4	81.0	4.5	78.7	6.8	.961	.26	.46	.81
5	80.5	4.3	78.3	6.5	.949	.14	.32	.81
6	80.0	3.8	78.1	5.7	.943	.10	.00	.84
7	79.6	3.3	77.9	5.0	.937	.06	1.73	.85
8	79.4	3.1	77.8	4.7	.934	.03	.61	.86
9	79.5	2.8	78.1	4.2	.943	.14	.44	.88
10	79.3	2.7	77.9	4.1	.937	.08	.39	.88
11	79.3	2.4	78.1	3.6	.943	.14	.23	.89

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	...	0.54	E. & S.	Cloudy; also drizzling between Noon & 2 P. M.
2	..	0.33	S. E. & S.	Cloudy & raining after intervals.
3	...	2.40	S. W. & S. E.	Cloudy & constantly raining.
4	...	0.12	S. W. & S.	Cloudy & drizzling between 9 A. M. & Noon & between 10 & 11 P. M.
5	...	0.39	S. & S. W.	Cloudy & constantly drizzling before sunrise.
6	...	...	S. & S. W.	Cloudy.
7	*Sunday.*	..		
8	129.4	...	S.	Scatd. clouds.
9	122.2	...	S. & S. E.	Cloudless till 5 A. M. cloudy till 8 P. M. cloudless afterwards; also slightly drizzling between 9 & 10 A. M.
10	118.5	0.10	S.	Scatd. clouds till 2 P. M. cloudy till 7 P. M. cloudless afterwards; also slightly drizzling at 4 P. M.
11	136.0	0.12	S.	Cloudless till 4 A. M. Scatd. clouds afterwards; also drizzling at 4 P. M.
12	...	0.56	E. & S. E. & N. E.	Cloudy; also raining between 1 & 7 P. M.
13	...	0.20	E.	Scatd. clouds till 9 P. M. cloudless afterwards; also drizzling between 11 A. M. & 1 P. M.
14	*Sunday.*	0.18		
15	...	0.12	E.	Cloudless till 3 A. M. cloudy afterwards; also occasionally drizzling between Noon & 7 P. M.
16	...	0.63	E.	Cloudless till 4 A. M. cloudy afterwards; also occasionally drizzling.
17	...	0.34	E.	Cloudy; also occasionally drizzling.
18	...	1.82	S. & S. E.	Cloudy; also raining after intervals.
19	...	0.42	S. & E.	Cloudy; also constantly raining between Midnight & Noon.
20	...	0.18	S. W. & S.	Cloudy; also drizzling at 6 P. M.
21	*Sunday.*	0.97		
22	...	0.08	E.	Cloudy; with rain beetween 6 & 7 A. M.
23	...	...	E. & S. E. & S.	Scatd. clouds till 8 A. M. Scatd. clouds afterwards; also drizzling at Noon & 2 P. M.
24	...	0.10	S. & S. W.	Cloudy; also slightly drizzling at 1 & 11 A. M.
25	...	...	S.	Cloudy; also slightly drizzling at 6 P. M.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
26	...		S.	Cloudy; also occasionally drizzling.
27	...		S. & S. W.	Scatd. ⌣i till 8 A. M. Scatd. clouds afterwards.
28	*Sunday.*	0.90		
29	...	0.17	S. W. & S.	Cloudy, with rain at 7 P. M.
30	...	0.26	S. W. & W. & S.	Cloudy, with constant drizzling between 5 & 9 P. M.
31	...	...	S. W. & S. & W.	Cloudy.

⌒i Cirri, ⌣i Cirro strati, ∩i Cumuli, ⌢i Cumulo strati, ⌒⌣i Nimbi, —i Strati ⌒ i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ...	29.534
Max. height of the Barometer occurred at 10 A. M. on the 13th, ..	29.678
Min. height of the Barometer occurred at 5 P. M. on the 17th, ..	29.259
Extreme range of the Barometer during the month, ...	0.419
Mean of the daily Max. Pressures, ...	29.586
Ditto ditto Min. ditto, ...	29.474
Mean daily range of the Barometer during the month, ...	0.112

	o
Mean Dry Bulb Thermometer for the month, ...	83.1
Max. Temperature occurred at 3 P. M. on the 8th and 11th, ..	91.6
Min. Temperature occurred at 7 P. M. on the 30th, ...	78.4
Extreme range of the Temperature during the month, ...	13 2
Mean of the daily Max. Temperature, ...	87.3
Ditto ditto Min. ditto, ...	80.2
Mean daily range of the Temperature during the month, ..	7.1

	o
Mean Wet Bulb Thermometer for the month, ...	79.8
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	3.3
Computed Mean Dew-point for the month, ...	78.1
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	5.0
	Inches
Mean Elastic force of Vapour for the month, ...	0.943

	Troy grains.
Mean Weight of Vapour for the month, ...	10.12
Additional Weight of Vapour required for complete saturation, ..	1.74
Mean degree of humidity for the month, complete saturation being unity,	0.85

	Inches
Rained 26 days, Max. fall of rain during 24 hours, ...	2.40
Total amount of rain during the month, ...	10.93
Prevailing direction of the Wind, ...	S. & E. & S. W.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.					4		3	1	16		1	1					1		2
1					5	1	3	2	17	1	1	1					1		
2					5	1	4	2	16	2	1	1					1		
3					5		4	2	14	1	1	1							3
4					7		3		11		1	1							5
5					8	1	3		11	1	2		1						2
6			1		5	1	5	1	11		4	1	1						
7					7	1	3	1	10		6	2	1						
8			1		6	1	3		7		7								3
9			1		4		4		11	1	6		1						
10			1		4	1	3	1	11	1	8	1							
11					5	1	3	1	9	1	9	2	1						
Noon.					4	2	4	3	10	3	6	1	3	1					
1					4	2	6	2	8	1	6		3	1					
2			1		4	1	4	3	8	1	8		2	1					
3					7	1	2		6		11	1	1						
4			1		5	2	2		10	3	5		1						3
5			2		5	1	1		12		4	1	2						1
6			2		5	1	1		13	2	5	1	1						
7			1	1	4		3	2	14	1	4	1							1
8			1		4	1	3		15		4	1							
9			1		4		3	1	15	1	4	2							
10					7		2	1	12		5	1							1
11					6		2	1	11		6	1							2

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.565	29.624	29.518	0.106	84.1	91.4	80.2	11.2
2	.640	.710	.586	.124	82.8	88.4	80.0	8.4
3	.691	.736	.642	.094	83.6	88.0	79.8	8.2
4	*Sunday.*							
5	.747	.795	.689	.106	85.3	91.7	80.6	11.1
6	.718	.778	.615	.163	85.8	91.8	81.8	10 0
7	.685	.739	.632	.107	79.5	83.8	77.2	6.6
8	.698	.757	.641	.116	80.3	83.9	77.8	6.1
9	.702	.747	.645	.102	79.8	86.2	76.0	10.2
10	.731	.786	.668	.118	83.2	90.2	79.0	11.2
11	*Sunday.*							
12	.660	.721	.585	.136	83.9	90.9	80.4	10.5
13	.606	.654	.537	.117	84.0	89.2	80.4	8.8
14	.570	.610	.512	.098	85.0	90.4	80.8	9.6
15	.564	.605	.513	.092	84.5	90.6	79.8	10.8
16	.547	.595	.482	.113	83.6	87.2	80.8	6.4
17	.495	.553	.401	.152	82.8	88.0	79.6	8.4
18	*Sunday.*							
19	.461	.525	.393	.132	83.6	88.8	80.0	8.8
20	.428	.484	.357	.127	82.7	88.4	79.9	8.5
21	.506	.597	.434	.163	80.5	83.6	79.0	4.6
22	.610	.649	.575	.074	80.5	85.0	77.9	7.1
23	.589	.643	.521	.122	82.7	86.2	80.4	5.8
24	.557	.645	.498	.147	82.6	86.8	80.4	6.4
25	*Sunday.*							
26	.625	.679	.557	.122	83.2	87.4	79.9	7.5
27	.601	.655	.533	.122	82.8	88.4	80.5	7.9
28	.582	.634	.507	.127	83.7	88.0	80.4	7.6
29	.560	.617	.489	.128	83.3	89.8	80.1	9.7
30	.515	.567	.457	.110	82.6	87.2	80.2	7.0
31	.450	.522	.355	.167	83.3	89.2	78.2	11.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	80.8	3.3	79.1	5.0	0.973	10.42	1.79	0.85
2	79.7	3.1	78.1	4.7	.943	.12	.63	.86
3	80.1	3.5	78.3	5.3	.949	.18	.85	.85
4	*Sunday.*							
5	80.3	5.0	77.8	7.5	.934	9.97	2.67	.79
6	80.6	5.2	78.0	7.8	.940	10.03	.80	.78
7	77.4	2.1	76.3	3.2	.890	9.63	1.03	.90
8	77.7	2.6	76.4	3.9	.893	.64	.27	.88
9	77.4	2.4	76.2	3.6	.887	.58	.17	.89
10	79.6	3.6	77.8	5.4	.934	10.03	.86	.84
11	*Sunday.*							
12	80.2	3.7	78.3	5.6	.949	.16	.97	.84
13	80.6	3.4	78.9	5.1	.967	.37	.80	.85
14	80.5	4.5	78.2	6.8	.946	.11	2.42	.81
15	80.3	4.2	78.2	6.3	.946	.13	.22	.82
16	80.0	3.6	78.2	5.4	.946	.15	1.88	.84
17	79.4	3.4	77.7	5.1	.931	.00	.75	.85
18	*Sunday.*							
19	80.1	3.5	78.3	5.3	.949	.18	.85	.85
20	79.7	3.0	78.2	4.5	.946	.15	.57	.87
21	78.6	1.9	77.6	2.9	.928	.01	0.97	.91
22	78.6	1.9	77.6	2.9	.928	.01	.97	.91
23	80.4	2.3	79.2	3.5	.976	.48	1.24	.89
24	79.7	2.9	78.2	4.4	.946	.17	.51	.87
25	*Sunday.*							
26	79.8	3.4	78.1	5.1	.943	.12	.77	.85
27	80.1	2.7	78.7	4.1	.961	.33	.42	.88
28	80.8	2.9	79.3	4.4	.979	.51	.56	.87
29	80.3	3.0	78.8	4.5	.964	.34	.59	.87
30	80.0	2.6	78.7	3.9	.961	.33	.35	.88
31	79.5	3.8	77.6	5.7	.928	9.95	.98	.83

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.620	29.774	29.457	0.317	81.2	83.8	77.1	6.7
1	.608	.743	.437	.306	81.0	83.8	76.0	7.8
2	.596	.744	.416	.328	80.8	82.6	76.6	6.0
3	.585	.734	.412	.322	80.6	82.2	76.8	5.4
4	.592	.728	.434	.294	80.4	82.0	76.8	5.2
5	.590	.745	.417	.328	80.0	81.8	77.0	4.8
6	.604	.763	.431	.332	80.0	81.8	77.0	4.8
7	.619	.774	.450	.324	80.7	83.0	77.2	5.8
8	.638	.789	.471	.318	81.8	84.5	77.6	6.9
9	.643	.795	.477	.318	83.7	86.8	77.2	9.6
10	.643	.794	.484	.310	85.1	89.2	77.6	11.6
11	.632	.784	.450	.334	86.2	89.8	77.2	12.6
Noon.	.615	.777	.443	.334	86.9	90.2	77.2	13.0
1	.596	.757	.420	.337	86.7	91.1	77.6	13.5
2	.573	.724	.408	.316	86.4	91.4	79.1	12.3
3	.553	.705	.371	.334	85.6	91.8	79.3	12.5
4	.535	.704	.355	.349	85.1	90.8	79.8	11.0
5	.536	.689	.359	.330	84.5	89.4	80.0	9.4
6	.545	.703	.375	.328	83.3	87.6	79.8	7.8
7	.560	.704	.377	.327	82.7	86.0	79.8	6.2
8	.589	.740	.403	.337	82.3	85.0	79.1	5.9
9	.613	.776	.432	.344	82.0	84.8	79.2	5.6
10	.622	.776	.428	.348	81.6	83.6	79.0	4.6
11	.623	.782	.420	.362	81.4	83.6	77.8	5.8

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	79.2	2.0	78.2	3.0	0.946	10.19	1.02	0.91
1	79.0	2.0	78.0	3.0	.940	.13	.01	.91
2	79.0	1.8	78.1	2.7	.943	.16	0.91	.92
3	78.9	1.7	78.0	2.6	.940	.13	.88	.92
4	78.7	1.7	77.8	2.6	.934	.07	.87	.92
5	78.3	1.7	77.4	2.6	.922	9.95	.86	.92
6	78.3	1.7	77.4	2.6	.922	.95	.86	.92
7	78.7	2.0	77.7	3.0	.931	10.04	1.00	.91
8	79.3	2.5	78.0	3.8	.940	.11	.29	.89
9	80.0	3.7	78.1	5.6	.943	.10	.97	.84
10	80.5	4.6	78.2	6.9	.946	.11	2.46	.80
11	80.9	5.3	78.2	8.0	.946	.09	.90	.78
Noon.	81.2	5.7	78.3	8.6	.949	.09	3.16	.76
1	81.2	5.5	78.4	8.3	.952	.15	.03	.77
2	81.0	5.4	78.3	8.1	.949	.12	2.94	.78
3	80.7	4.9	78.2	7.4	.946	.11	.65	.79
4	80.6	4.5	78.3	6.8	.949	.14	.43	.81
5	80.3	4.2	78.2	6.3	.946	.13	.22	.82
6	79.9	3.4	78.2	5.1	.946	.15	1.78	.85
7	79.7	3.0	78.2	4.5	.946	.15	.57	.87
8	79.4	2.9	77.9	4.4	.937	.08	.50	.87
9	79.3	2.7	77.9	4.1	.937	.08	.39	.88
10	79.2	2.4	78.0	3.6	.940	.11	.23	.89
11	79.2	2.2	78.1	3.3	.943	.16	.11	.90

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	...	2.58	S. & W.	Scatd. _i till 2 P.M. cloudy afterwards; also raining between 3 & 9 P. M.
2	..	0.40	E. & S.	Cloudy, with drizzling between 6 & 8 A. M. & also at 3 P. M.
3	...	0.14	S. & E.	Cloudless till 5 A. M. Scatd. clouds till 7 P. M. cloudless afterwards; also drizzling at Noon & 2 P. M.
4	*Sunday.*	...		
5	135.0	...	S. & E.	Cloudless till 1 A. M. Scatd. clouds till 8 P. M. cloudless afterwards.
6	129.0	...	S. & S. W.	Scatd clouds.
7	...	1.08	S. & calm.	Cloudy, with incessant drizzling between 2 A. M. & 1 P. M.
8	...	...	S. & S. W.	Cloudy; also drizzling at Midnight & also between 9 A. M. & 1 P. M. & also between 10 & 11 P. M.
9	...	1.18	S.	Cloudy; also incessantly raining between Midnight & 4 A. M.; also drizzling at 8 A. M. & 3 P. M. & 6 P. M.
10	123.9	...	S. E. & S.	Scatd. clouds till 7 P. M. cloudless afterwards.
11	*Sunday.*	...		
12	...	...	S. & S. E.	Scatd. clouds, with slight drizzling at 8 P. M.
13	117.4	0.12	S. E. & S.	Cloudless till 6 A. M. Scatd. _i till 11 A. M. Scatd. ⌒i afterwards; also raining at 1 P. M.
14	118.4	...	S.	Cloudless till 6 A. M. Scatd _i & ⌒i till 5 P. M. cloudless afterwards; also slightly drizzling at 2 P. M.
15	119.0	0.10	S. E. & E.	Cloudless till 5 A. M. Scatd. _i afterwards; also slightly raining at 3 P. M.
16	...	0.11	S. & S. E.	Scatd. clouds, with occasional drizzling.
17	...	0.24	E. & S. E.	Cloudless till 6 A. M. Scatd. clouds afterwards, with occasional raining.
18	*Sunday.*	0.12		
19	122.0	0.15	E. & N. E.	Scatd \i & _i; also slightly drizzling at 4 P. M.
20	...	2.12	N. E. & E. & S.	Cloudy, with incessant rain between 2 & 9 P. M.
21	...	0.39	S. & S. E.	Cloudy & constantly drizzling.
22	...	2.16	S. E. & S. & E.	Cloudy, with constant rain.
23	...	1.72	S. W. & S. & S. E.	Cloudy; also raining at 6 & 7 A. M. & 11 P. M.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
24	...	0.94	E. & W.	Cloudy, with occasional rain.
25	*Sunday.*	0.13		
26	118.0	...	E.	Cloudy, with occasional drizzling till 8 P. M. cloudless afterwards.
27	124.5	1.18	S. E. & S.	Cloudy; also drizzling at 5 & 6 A. M. & raining heavily at 2 P. M.
28	...	0.10	E. & S.	Seatd. ⌣i till 11 A. M. cloudy till 7 P. M. cloudless afterwards; also raining at 1 P. M.
29	...	...	E. & S. E. & S.	Seatd. clouds till 7 P. M. cloudless afterwards; also slightly drizzling at 2 P. M.
30	...	0.60	N. E. & calm.	Cloudless till 6 A. M. Seatd. clouds afterwards; also raining at 11 A. M. & 3 & 6 P. M.
31	...	0.56	N. & N. E.	Cloudy & drizzling at 5 A. M. & between 3 & 11 P. M.

)i Cirri, ⌣i Cirro strati,)i Cumuli,)i Cumulo strati, ⌣i Nimbi, —ı Strati, Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ...	29.597
Max. height of the Barometer occurred at 9 A. M. on the 5th, ..	29.795
Min. height of the Barometer occurred at 4 P. M. on the 31st, ..	29.355
Extreme range of the Barometer during the month, ...	0.440
Mean of the daily Max. Pressures, ...	29.653
Ditto ditto Min. ditto, ...	29.531
Mean daily range of the Barometer during the month, ...	0.122

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	o
Mean Dry Bulb Thermometer for the month, ...	83.0
Max. Temperature occurred at 3 P. M. on the 6th, ...	91.8
Min. Temperature occurred at 1 P. M. on the 9th, ...	76.0
Extreme range of the Temperature during the month, ...	15.8
Mean of the daily Max. Temperature, ...	88.2
Ditto ditto Min. ditto, ...	79.7
Mean daily range of the Temperature during the month, ..	8.5

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	o
Mean Wet Bulb Thermometer for the month, ...	79.7
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	3.3
Computed Mean Dew-point for the month, ...	78.0
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	5.0
	Inches
Mean Elastic force of Vapour for the month, ...	0.940

	Troy grains.
Mean Weight of Vapour for the month, ...	10.09
Additional Weight of Vapour required for complete saturation, ..	1.73
Mean degree of humidity for the month, complete saturation being unity,	0.85

	Inches
Rained 26 days, Max. fall of rain during 24 hours, ...	2.58
Total amount of rain during the month, ...	16.12
Prevailing direction of the Wind, ...	S. & E. & S. E.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.			2		8		3		13	2					1	1			
1			2		8		4	1	12	1					1				
2			2		7		4	1	13	2					1				
3			2		7		4	1	11	2					1				2
4			2		3	1	4	1	11	2					1				6
5	1		3	1	7	1	3	1	9	1	1		1	1					2
6	1		2		6	1	5	1	9		2	1	1	1	1				
7	1		2		9	1	6	2	5	1	2		1		1				
8	2		3		5	1	4		6	2	2		1	1					4
9			4		9	2	6		8	2									
10			5		7	1	7		8	2									
11			5	1	7		7		8	2									
Noon.			5		5	1	8	2	7	3	2								
1	1		2		9	1	8	2	6	3			1						
2	2	1	2	1	6	1	3	2	11	2	3	1							
3	1	1	2	2	4	1	10	2	4	1	6	2							
4	2	1	1	1	2		7	4	11	1	1		1						2
5	1				5	1	7	1	11	1	2		1	1					
6	1	1	1		4	2	4		10	3	2		2	1			2	1	1
7	1	1	1		6	2	4		9	1	2		1	1			3		
8	1		1		7	1	3		11	1	1		1	1			2		
9	1		1		7	1	2		11		2		1	1			2		
10	1	1	1		7	1	2		12	1	1		1				2		
11	1	1	1		7		2		11	2	1		1				2		1

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Sea level, 18.11 Feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	*Sunday.*							
2	29.505	29.554	29.453	0.101	84.6	90.4	79.4	11.0
3	.506	.565	.431	.134	85.9	90.2	82 3	7.9
4	.446	.487	.368	.119	82.6	87.0	78.6	8.4
5	.484	.558	.435	.123	80.2	82.8	78.6	4.2
6	.568	.620	.513	.107	83.4	89.0	79.0	10.0
7	.609	.652	.556	.096	83.5	88.2	80.2	8.0
8	*Sunday.*							
9	.638	.688	.581	.107	84.7	90.0	81.2	8.8
10	.659	.722	.606	.116	84.7	89.8	81.2	8.6
11	.704	.770	.653	.117	85.1	89.8	81.7	8.1
12	.726	.790	.667	.123	83.7	87.2	80.2	7.0
13	.712	.772	.651	.121	84.4	88.8	79.6	9.2
14	.708	.770	.636	.134	84.0	89.2	79.7	9.5
15	*Sunday.*							
16	.649	.695	.575	.120	83.7	89.0	81.2	7.8
17	.680	.730	.620	.110	84.5	91.8	79.4	12.4
18	.724	.782	.674	.108	83.2	85.4	81.6	3.8
19	.702	.757	.637	.120	82.8	89.4	80.6	8.8
20	.642	.698	.582	.116	80.9	83.2	79.6	3.6
21	.645	.715	.593	.122	81.9	85.6	78.6	7.0
22	*Sunday.*							
23	.778	.836	.724	.112	83.6	88.4	79.2	9.2
24	.757	.826	.679	.147	85.3	91.2	80.6	10.6
25	.746	.790	.686	.104	84.7	90.0	81.2	8.8
26	.795	.854	.749	.105	84.3	90.1	80.2	9.9
27	.811	.879	.737	.142	85.5	91.6	80.6	11.0
28	.753	.810	.702	.108	82.3	89.2	78.8	10.4
29	*Sunday.*							
30	.673	.730	.597	.133	82.1	86.6	79.0	7.6

The Mean height of the Barometer as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	*Sunday.*							
2	81.0	3.6	79.2	5.4	0.976	10.45	1.94	0.84
3	82.5	3.4	80.8	5.1	1.027	.96	.91	.85
4	79.9	2.7	78.5	4.1	0 955	.27	.41	.88
5	77.9	2.3	76.7	3.5	.902	9.72	.16	.89
6	79.8	3.6	78.0	5.1	.940	10.09	.87	.84
7	80.5	3.0	79.0	4.5	.970	.40	.60	.87
8	*Sunday.*							
9	80.8	3.9	78.8	5.9	.961	.31	2.11	.83
10	81.0	3.7	79.1	5.6	.973	.40	.02	.84
11	81.1	4.0	79.1	6.0	.973	.40	.17	.83
12	80.4	3.3	78.7	5.0	.961	.31	1.76	.85
13	80.9	3.5	79.1	5.3	.973	.42	.89	.85
14	80.5	3.5	78.7	5.3	.961	.31	.86	.85
15	*Sunday.*							
16	80.0	3.7	78.1	5.6	.943	.10	.97	.84
17	79.8	4.7	77.4	7.1	.922	9.87	2.48	.80
18	79.9	3.3	78.2	5.0	.946	10.15	1.74	.85
19	79.8	3.0	78.3	4.5	.949	.18	.57	.87
20	79.0	1 9	78.0	2.9	.940	.13	0.97	.91
21	79.3	2.6	78.0	3.9	.940	.11	1.33	.88
22.	*Sunday.*							
23	80.2	3.4	78.5	5.1	.955	.25	.78	.85
24	81.0	4.3	78.8	6.5	.964	.29	2.35	.81
25	80.4	4.3	78.2	6.5	.946	.11	.31	.81
26	79.6	4.7	77.2	7.1	.916	9.81	.47	.80
27	80.1	5.4	77.4	8.1	.922	.85	.87	.77
28	79.0	3.3	77.3	5.0	.919	.88	1.70	.85
29	*Sunday.*							
30	79.3	2.8	77.9	4.2	.937	10.08	.43	.88

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.677	29.817	29.460	0.357	81.7	84.8	79.0	5.8
1	.665	.808	.456	.352	81.5	84.2	79.0	5.2
2	.653	.797	.447	.350	81.4	84.0	79.0	5.0
3	.642	.788	.435	.353	81.1	83.8	79.0	4.8
4	.656	.783	.434	.349	81.1	83.8	79.2	4.6
5	.633	.799	.436	.363	80.8	83.8	78.6	5.2
6	.669	.824	.443	.381	80.7	83.6	78.8	4.8
7	.685	.854	.452	.402	81.1	83.8	78.6	5.2
8	.704	.879	.460	.419	83.0	85.6	80.3	5.3
9	.717	.872	.473	.399	84.5	87.6	80.6	7.0
10	.715	.867	.479	.388	85.4	88.5	80.0	8.5
11	.706	.859	.469	.390	86.2	89.2	79.3	9.9
Noon.	.686	.842	.427	.415	87.0	90.0	80.6	9.4
1	.661	.817	.379	.438	87.1	90.0	78.8	11.2
2	.633	.780	.368	.412	86.9	91.2	79.8	11.4
3	.617	.760	.405	.355	86.9	91.8	80.4	11.4
4	.610	.749	.426	.323	86.3	91.6	79.2	12.4
5	.610	.758	.416	.342	85.2	89.8	79.2	10.6
6	.623	.765	.419	.346	84.3	88.0	78.6	9.4
7	.643	.791	.453	.338	83.6	86.2	79.2	7.0
8	.668	.822	.465	.357	83.1	86.4	79.5	6.9
9	.685	.838	.487	.351	82.7	86.2	79.3	6.9
10	.691	.834	.487	.347	82.4	85.8	79.3	6.5
11	.696	.820	.482	.338	81.8	84.8	79.2	5.6

The Mean Height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew point.	Dry Bulb above Dew point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	79.4	2.3	78.2	3.5	0.916	10.17	1.20	0.89
1	79.4	2.1	78.3	3.2	.919	.22	.09	.90
2	79.4	2.0	78.4	3.0	.952	.25	.02	.91
3	79.2	1.9	78.2	2.9	.946	.19	0.98	.91
4	79.3	1.8	78.4	2.7	.952	.25	.92	.92
5	78.9	1.9	77.9	2.9	.937	.10	.97	.91
6	78.8	1.9	77.8	2.9	.934	.07	.97	.91
7	79.3	1.8	78.4	2.7	.952	.25	.92	.92
8	80.1	2.9	78.6	4.4	.958	.30	1.52	.87
9	80 6	3.9	78 6	5.9	.958	.26	2.09	.83
10	80.8	4.6	78.5	6.9	.955	.21	.47	.81
11	81.1	5.1	78.5	7.7	.955	.18	.81	.78
Noon.	81.4	5.6	78.6	8.4	.958	.21	3.08	.77
1	81.2	5.9	78.2	8.9	.946	.07	.26	.76
2	81.1	5.8	78.2	8.7	.946	.07	.18	.76
3	81.2	5.7	78.3	8.6	.949	.09	.16	.76
4	80 9	5.4	78.2	8.1	.946	.09	2.93	.78
5	80.5	4.7	78.1	7.1	.943	.08	.53	.80
6	80.5	3.8	78.6	5.7	.958	.26	.02	.84
7	80.5	3.1	78.9	4.7	.967	.37	1.66	.86
8	80.1	3.0	78.6	4.5	.958	.28	.58	.87
9	79.9	2.8	78.5	4 2	.955	.27	.45	.88
10	79.8	2.6	78.5	3.9	.955	.27	.34	.89
11	79.4	2.4	78.2	3.6	.946	.17	.23	.89

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	*Sunday*	2.15		
2	130.0	0.50	S. & E.	Cloudy till 7 A. M. Scatd. ⌒i & ⌣i till 7 P. M. cloudless afterwards; also rainirg at 3 & 4 A. M.
3	...	0.26	S. & calm.	Cloudless till 4 A. M. cloudy afterwards; also raining at Noon.
4	...	3.01	W.	Cloudy; also incessant rain between 2 & 8 P. M.
5	...	0.56	W.	Cloudy; also drizzling at 10 & 11 A. M. & 8 & 9 P. M.
6	...	0.08	S. & S. W.	Cloudy till 6 A. M. Scatd. ⌣i & ⌒i till 5 P. M. cloudless afterwards; also raining between 1 & 2 A. M.
7	...	0.11	S.	Cloudy till 5 P. M. cloudless afterwards; also drizzling at 7 & 10 A. M.
8	*Sunday.*	0.34		
9	132.8	...	S.	Cloudless till 5 A. M. Scatd ⌣i & ⌒i afterwards.
10	...	0.40	S. & S. E.	Cloudless till 2 A. M. Scatd. ⌣i & ⌒i till 5 P. M. cloudless afterwards; also raining at 3 A. M. & drizzling between 3 & 4 P. M.
11	127.0	...	S.	Cloudless till 4 A. M. Scatd. ⌣i & ⌒i till 6 P. M. cloudless afterwards.
12	...	0.72	S.	Cloudy; also occasionally drizzling between Midnight & Noon.
13	...	1.09	S. & S. W.	Cloudy; also raining at 8 & 11 P. M.
14	...	...	S. & S. W.	Cloudy; also drizzling at Midnight & 11 A. M.
15	*Sunday.*	0.16		
16	125.0	...	W. & S.	Cloudy till 5 P. M. cloudless afterwards.
17	135.4	...	N. & W.	Cloudy.
18	...	...	E. & S. W. & S.	Scatd. ⌣i & ⌃i till 5 A. M. cloudy afterwards; also drizzling at 9 A. M.
19	135.0	0.26	S. & N. E.	Cloudy; also drizzling at 2 & 3 P. M.
20	...	0.41	N. E.	Cloudy; also drizzling at 7 A. M. & between 2 & 6 P. M.
21	121.4	0.30	S. E. & E.	Cloudy; also drizzling between 1 & 4 A. M. & at 5 P. M.
22	*Sunday.*	0.38		
23	137.0	...	S. & S. E.	Scatd. clouds of various kinds till 9 A. M. cloudless afterwards; also drizzling at 7 A. M.

⌃i Cirri, ⌣i Cirro strati, ⌒i Cumuli, ⌒i Cumulo strati, ⌄i Nimbi, —i Strati, ⌄i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
		Inches.		
24	140.0	...	S. & S. W.	Cloudless till 6 A. M. Scatd. ⌣i & ⌢i till 7 P. M. cloudless afterwards.
25	136.0	...	S. & calm.	Cloudless till 7 A. M. Scatd. ⌣i & ⌢i till 8 P. M. cloudless afterwards.
26	138.5	...	S.	Scatd. clouds till 8 P. M. cloudless afterwards.
27	142.0	...	E. & S. E.	Cloudless till 6 A. M. Scatd. ⌣i & ⌢i till 9 P. M. cloudless afterwards ; also drizzling at 7 P. M.
28	127.0	0.70	E. & N.	Cloudless till 5 A. M. cloudy afterwards ; also drizzling between 1 & 7 P. M.
29	*Sunday.*	0.79		
30	...	0.26	E. & S. E.	Cloudless till 4 A. M. cloudy till 6 P. M. cloudless afterwards ; also raining between Noon & 1 P. M.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ..	29.665
Max. height of the Barometer occurred at 8 A. M. on the 27th,	29.879
Min. height of the Barometer occurred at 2 P. M. on the 4th,	29.368
Extreme range of the Barometer during the month, ..	0.511
Mean of the Daily Max. Pressures,	29.722
Ditto ditto Min. ditto, ...	29.604
Mean daily range of the Barometer during the month,	0.118

	o
Mean Dry Bulb Thermometer for the month,	83.7
Max. Temperature occurred at 3 P. M. on the 17th,	91.8
Min. Temperature occurred at 5 A. M. on the 5th,	78.6
Extreme range of the Temperature during the month,	13.2
Mean of the daily Max. Temperature, ..	88.6
Ditto ditto Min. ditto, ..	80.1
Mean daily range of the Temperature during the month,	8.5
Mean Wet Bulb Thermometer for the month,.. ..	80.1
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,	3.6
Computed Mean Dew-point for the month, ...	78.3
Mean Dry Bulb Thermometer above computed Mean Dew-point,	5.4

	Inches
Mean Elastic force of Vapour for the month,	0.949

	Troy grains
Mean Weight of Vapour for the month,	10.18
Additional Weight of Vapour required for complete saturation,	1.89
Mean degree of humidity for the month, complete saturation being unity,	0.84

	Inches
Rained 22 days, Max. fall of rain during 24 hours,	3.01
Total amount of rain during the month,	12.48
Prevailing direction of the Wind, ..	S.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
	No. of days.																		
Midnight.	1		1		2		1		11	1	2		1				5		1
1	1		1		2		1		13	1	2		1				4		
2	1	1	1		2		1		13	1	2	1	2				3		
3	1	1	1		2		2	1	11	1	2		2				3		1
4			1		3	1	1		10	1	1		1				3		5
5	1		1		2		1		7		3		2				2		6
6	2		1		5		1		10	1	2		2				2		
7	2		1	1	5	1	1		11	2	1		2				2		
8	1		2		4				13		1		4						
9	2		1		1		2		13		1	1	3		1				1
10	2		2		3		1		11	1	2		4	1					
11	1		2		2		4		12		1		3	1					
Noon.	1		4		1		3		9	2	5		1		1				
1	2		4	1			5	1	7		5		2						
2			3	2	4	2	2		10		3		2		1				
3			4	2	3	1	3		9		4		1		1				
4	2	1	4	2	4		4		6	1	4		1						
5	1	1	2	1	5	2	2		12				1		2				
6	1	1	2	1	3		2		13		1		2		1				
7			2		3	2	2		12		2		4						
8			1		3		2		12	1	4	1	3	1					
9			1		3		2		11		4	1	3				1		
10			1		3		2		10		4		2				2		1
11			1		2		2		9	1	4	1	3				2		2

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Sea level, 18.11 Feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.661	29.729	29.613	0 116	82.0	87.4	79.6	7.8
2	.649	.704	.586	.118	81.5	85.0	79.2	5.8
3	.674	.723	.618	.105	83.0	88.8	78.3	10.5
4	.654	.728	.585	.143	84.5	90.0	80.4	9.6
5	.593	.676	.523	.153	79.6	83.2	74.0	9.2
6	*Sunday.*							
7	.728	.778	.691	.087	82.5	87.6	78.8	8.8
8	.719	.785	.615	.170	81.9	86.6	77.0	9.6
9	.708	.764	.655	.109	78.8	81.8	76.0	5.8
10	.729	.783	.686	.097	79.9	84.4	76.0	8.4
11	.774	.819	.730	.089	82.2	86.3	78.6	7.7
12	.803	.861	.754	.107	82.8	88.0	79.0	9.0
13	*Sunday.*							
14	.796	.859	.732	.127	82.6	85.6	79.8	5.8
15	.747	.811	.675	.136	81.4	86.0	78.8	7.2
16	.749	.798	.688	.110	82.5	87.4	79.4	8.0
17	.816	.901	.752	.149	81.1	87.0	78.2	8.8
18	.916	.979	.847	.132	79.2	82.9	76.0	6.9
19	.939	30.007	.892	.115	81.3	87.0	76.0	11.0
20	*Sunday.*							
21	.946	.018	.902	.116	82.7	89.0	78.2	10.8
22	.965	.049	.923	.126	82.4	87.7	76.8	10.9
23	.941	.009	.900	.109	81.4	85.9	78.2	7.7
24	.713	29.985	.841	.144	81.0	87.0	77.2	9.8
25	.901	.985	.851	.134	80.6	85.5	76.6	8.9
26	.905	.977	.863	.114	79.2	85.4	73.0	12.4
27	*Sunday.*							
28	.869	.944	.808	.136	79.3	85.2	74.4	10.8
29	.846	.901	.796	.105	78.6	85.0	73.8	11.2
30	.855	.928	.814	.114	78.8	86.0	73.8	12.2
31	.856	.921	.807	.114	80.6	86.6	75.8	10.8

The Mean height of the Barometer as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	79.3	2.7	77 9	4.1	0.937	10.08	1.39	0.88
2	79 0	2.5	77.7	3.8	.931	.02	.29	.89
3	79.6	3.4	77.9	5.1	.937	.06	.76	.85
4	80.3	4.2	78.2	6.3	.946	.13	2.22	.82
5	77.8	1.8	76.9	2.7	.908	9.80	0.89	.92
6	*Sunday.*							
7	79.8	2.7	78.4	4.1	.952	10.23	1.41	.88
8	79.4	2.5	78 1	3.8	.943	.14	.30	.89
9	76.8	2.0	75 8	3.0	.876	9.48	0.96	.91
10	78.1	1.8	77.2	2.7	.916	.89	.89	.92
11	79.1	3.1	77.5	4.7	.925	.94	1.60	.86
12	79.4	3.4	77.7	5.1	.931	10.00	.75	.85
13	*Sunday.*							
14	78.4	4.2	76.3	6.3	.890	9.57	2.11	.82
15	78.1	3.3	76.4	5.0	.893	.62	1.65	.85
16	77.9	4.6	75.6	6.9	.871	.35	2 29	.80
17	77.4	3.7	75.5	5.6	.868	.35	1.82	.84
18	76.1	3 1	74 5	4.7	.840	.09	.47	.86
19	76.9	4.4	74 7	6.6	.846	.10	2.14	.81
20	*Sunday.*							
21	77.7	5.0	75.2	7.5	.860	.22	.50	.79
22	77.3	5.1	74.7	7.7	.846	.08	.53	.78
23	77.6	3.8	75.7	5.7	.873	.40	1.87	.83
24	76.5	4.5	74.2	6.8	.832	8.96	2.18	.80
25	75.7	4 9	73.2	7.4	.806	.70	.31	.79
26	72.3	6.9	68.8	10.4	.699	7.56	3.00	.72
27	*Sunday.*							
28	74 0	5.3	71.3	8.0	.758	8.20	2.39	.77
29	73.5	5.1	70.9	7.7	.748	.10	.28	.78
30	74.0	4.8	71.6	7.2	.766	.28	.16	.79
31	75.5	5.1	72.9	7.7	.797	.59	.42	.78

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.796	29.951	29.618	0.333	79.3	83.0	75.8	7.2
1	.791	.943	.604	.339	79.0	82.6	75.6	7.0
2	.783	.935	.585	.350	78.5	82.8	75.2	7.6
3	.770	.927	.573	.354	78.5	82.4	74.7	7.7
4	.777	.935	.559	.376	78.0	82.2	74.2	8.0
5	.799	.949	.628	.321	77.9	81.0	73.8	7.2
6	.805	.979	.581	.398	77.8	81.8	73.0	8.8
7	.824	30.001	.597	.404	78.5	82.4	73.8	8.6
8	.836	.007	.653	.354	80.0	83.2	76.0	7.2
9	.863	.049	.653	.396	81.5	84 6	77.2	7.4
10	.862	.041	.676	.365	82.9	86.3	77.6	8.7
11	.844	.023	.648	.375	83.6	87.8	77.2	10.6
Noon.	.823	29.998	.621	.377	84.3	88.7	77.7	11.0
1	.794	.978	.589	.389	84.9	89.6	78 8	10.8
2	.771	.945	.566	.379	85.5	90.0	79.6	10.4
3	.757	.934	.551	.383	85.4	89.6	80.0	9.6
4	.765	.931	.535	.396	85.3	89.0	80.0	9.0
5	.761	.936	.523	.413	83.7	87.4	78.4	9.0
6	.769	.947	.543	.404	82.2	86.0	77.3	8.7
7	.790	.964	.567	.397	81.2	85.0	76.4	8.6
8	.808	.977	.577	.400	80.5	84.2	74.8	9.4
9	.819	.978	.600	.378	80.0	84.0	74.6	9.4
10	.815	.972	.604	.368	79.7	83.6	74.0	9.6
11	.824	.963	.624	.339	79.2	83.0	74.0	9.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Midnight.	77.1	2.2	76.0	3.3	0.882	9.54	1.05	0.90
1	77.0	2.0	76.0	3.0	.882	.54	0.96	.91
2	76.6	1.9	75.6	2.9	.871	.42	.93	.91
3	76.5	2.0	75.5	3.0	.868	.40	.95	.91
4	76.0	2.0	75.0	3.0	.854	.25	.94	.91
5	75.9	2.0	74.9	3.0	.851	.22	.94	.91
6	75.9	1 9	74.9	2.9	.851	.22	.91	.91
7	76.4	2.1	75.3	3.2	.862	.34	1.01	.90
8	76.6	3.4	74.9	5.1	.851	.19	.62	.85
9	77.3	4.2	75 2	6.3	.860	.26	2.05	.82
10	77.9	5.0	75.4	7.5	.865	.28	.51	.79
11	77.9	5.7	75.0	8.6	.854	.14	.89	.76
Noon.	78.0	6.3	74.8	9.5	.849	.07	3.21	.74
1	78.2	6.7	74 8	10.1	.849	.07	.42	.73
2	78.5	7.0	75.0	10.5	.854	.11	.61	.72
3	78.1	7.3	74.4	11.0	.838	8.95	.73	.71
4	78.2	7.1	74.6	10.7	.843	9.00	.64	.71
5	78.0	5.7	75.1	8.6	.857	.17	2.90	.76
6	78.0	4.2	75.9	6.3	.879	.46	.08	.82
7	77.8	3.4	76.1	5.1	.885	.53	1.68	.85
8	77 5	3.0	76.0	4.5	.882	.50	.48	.87
9	77.3	2.7	75.9	4 1	.879	.49	.32	.88
10	77.3	2.4	76.1	3.6	.885	.55	.17	.89
11	76.8	2.4	75.6	3.6	.871	.40	.16	.89

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	...	0.28	S. E.	Cloudless till 4 A. M. cloudy afterwards; also drizzling between 2 & 3 P. M.
2	...	0.23	E. & N. E.	Cloudless till 6 A. M. cloudy till 7 P. M. cloudless afterwards; also raining between 10 A. M. & Noon.
3	...	0.08	E. & S. E.	Cloudy till 7 P. M. cloudless afterwards; also incessantly drizzling between Midnight & 5 A. M.
4	130.0	...	E. & N. E.	Cloudless till 3 A. M. Scatd. clouds till 6 P. M. cloudless afterwards.
5	...	3.64	E. & W.	Cloudy; also constantly raining between 11 A. M. & 11 P. M.
6	*Sunday.*			
7	...	0.18	E. & W.	Cloudless till 6 A. M. Scatd. clouds till 6 P. M. cloudless afterwards; also drizzling between Noon & 1 P. M.
8	...	...	S. & W. & calm.	Cloudless till 4 A. M. cloudy afterwards; also raining at 1 P. M. & between 7 & 11 P. M.
9	...	1.68	S.	Cloudy; also incessantly raining between Midnight & 9 A. M.; also slightly drizzling at 2 P. M.
10	...	0.59	S. & S. E.	Cloudy; also incessantly drizzling between 7 & 11 A. M.
11	...	...	S.	Scatd. clouds till 6 P. M. cloudless afterwards; also drizzling at 6 A. M.
12	...	0.12	S.	Cloudless till 6 A. M. Scatd. ⌣i & ⌒i afterwards; also drizzling at 8 A. M.
13	*Sunday.*			
14	...	...	S. W.	Cloudless till 4 A. M. Scatd. clouds afterwards.
15	...	...	S. W. & N. W. & W.	Cloudy till 3 P. M. cloudless afterwards; also drizzling at 8 & 9 A. M. & at 2 & 3 P. M.
16	135 0	...	W.	Scatd. ⌣i & ⌒i.
17	124.0	0.30	S.	Cloudless till 7 A. M. Scatd. ⌣i & ⌒i afterwards; also raining at 4 P. M.
18	...	0.49	S. & W.	Cloudy; also raining at 6 A. M. and between Noon & 1 P. M. and also between 7 & 9 P. M.
19	140.0	...	N. & S. E.	Scatd. ⌣i & ⌒i till 4 P. M. cloudless afterwards.

⌒i Cirri, ⌣i Cirro strati, ⌒i Cumuli, ⌒i Cumulo strati, ⌣i Nimbi, —i Strati, ⌣i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
20	*Sunday.*			
21	128.4	...	N. W. & N.	Cloudless till 7 A. M. Scatd. clouds till 4 P. M. cloudless afterwards.
22	130.0	...	N. & N. E.	Cloudless till 10 A. M. Scatd. ⌒i till 3 P. M. cloudless afterwards.
23	142.0	0.16	N.	Cloudless till 3 A. M. Scatd. clouds afterwards; also drizzling at 11 A. M. & 5 P. M.
24	138.0	...	N. & E.	Scatd. _i till 3 P. M. cloudless afterwards.
25	...	...	N. & W.	Cloudless till 8 A. M. Scatd. clouds till 3 P. M. cloudless afterwards.
26	139.0	...	N. & N. E.	Cloudless.
27	*Sunday.*			
28	138.0	...	N.	Scatd. _i till 4 A. M. cloudless afterwards.
29	138.4	...	N. & W.	Cloudless till 6 A. M. Scatd. ⌒i till 4 P. M. cloudless afterwards.
30	139.0	...	N. & W.	Cloudless till 10 A. M. Scatd. _i till 4 P. M. cloudless afterwards.
31	137.0	...	N. W. & N.	Cloudless till 2 A. M. Scatd. _i till 6 P. M. cloudless afterwards.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ..	29.802
Max. height of the Barometer occurred at 9 A. M. on the 22nd,	30.049
Min. height of the Barometer occurred at 5 P. M. on the 5th,	29.523
Extreme range of the Barometer during the month, ..	0.526
Mean of the Daily Max. Pressures,	29.867
Ditto ditto Min. ditto, ...	29.746
Mean daily range of the Barometer during the month,	0.121

	o
Mean Dry Bulb Thermometer for the month,	81.2
Max. Temperature occurred at 2 P. M. on the 4th,	90.0
Min. Temperature occurred at 6 A. M. on the 26th,	73.0
Extreme range of the Temperature during the month,	17.0
Mean of the daily Max. Temperature, ..	86.2
Ditto ditto Min. ditto, ..	77.1
Mean daily range of the Temperature during the month,	9.1
Mean Wet Bulb Thermometer for the month,.. ..	77.3
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,	3.9
Computed Mean Dew-point for the month, ...	75.3
Mean Dry Bulb Thermometer above computed Mean Dew-point,	5.9

	Inches
Mean Elastic force of Vapour for the month,	0.862

	Troy grains
Mean Weight of Vapour for the month,	9.29
Additional Weight of Vapour required for complete saturation,	1.92
Mean degree of humidity for the month, complete saturation being unity,	0.83

	Inches
Rained 14 days, Max. fall of rain during 24 hours,	3.64
Total amount of rain during the month,	7.75
Prevailing direction of the Wind, ..	N. & S.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.	6		1		4		1		8	1	1		2		1		2		1
1	7		1		5	1	1		8	1	1		2		1		1		
2	8		1		5		1		6	1	1		1		1		1		2
3	8		1		5	1	1		7	1	1		1		1		1		1
4	7		1		5	1	3		4	1	1		1		1		1		3
5	7		1		5	1	3		4		2		1		1				3
6	7		1		5		3		5	3	1		3		2				
7	4		2		6		3	1	4	1	2		4		2				
8	5		2		3		3	1	3	2	2	1	3		1				5
9	8		2		3		5		4	2	2	1	3						
10	5		3		6		2		5	1	1		3		2				
11	5		3	1	4		1		7	3			2		5				
Noon.	4		1	1	3	1	2		7	1			6	1	4				
1	2		1		6	1			6		1		5	2	6	1			
2	3		3	1	2		2		6	1	1		4		6	1			
3	3		4	1	4				6		1		5	1	4	1			
4	6	1	1		2		1		4		1		4		2				6
5	9	1	1		1		1		5		2		5		2				1
6	9		2		3	1	1		5				4		2				1
7	7		2		4	2	1		5	1	1		4		3				
8	7		1		5	2	1		6	1	1		5		1				
9	7		1		5	2	1		6	1	1		5		1				
10	7		1		4	1	1		6	1	1		5		1				1
11	7		1		4	1	1		4		1		5		1				3

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.853	29.919	29.807	0.112	81.3	87.4	76.4	11.0
2	.890	.947	.852	.095	79.7	87.6	74.4	13.2
3	*Sunday.*							
4	.842	.904	.780	.124	77.9	83.0	73.8	9.2
5	.835	.894	.775	.119	79.4	84.8	74.8	10.0
6	.844	.910	.778	.132	80.4	87.0	75.8	11.2
7	.847	.917	.795	.122	78.6	82.4	76.8	5.6
8	.829	.898	.775	.123	78.4	81.0	76.4	4.6
9	.828	.885	.781	.104	78.4	84.6	75.6	9.0
10	*Sunday.*							
11	.847	.908	.792	.116	74.6	77.0	72.2	4.8
12	.855	.912	.817	.095	73.7	76.4	71.3	5.1
13	.873	.947	.825	.122	74.6	80.0	70.6	9.4
14	.858	.909	.812	.097	75.5	81.4	69.6	11.8
15	.837	.901	.795	.106	73.5	75.6	70.6	5.0
16	.850	.914	.810	.104	75.5	80.0	72.4	7.6
17	*Sunday.*							
18	.925	.997	.878	.119	76.0	81.4	72.0	9.4
19	.945	30.009	.905	.104	72.5	78.4	68.0	10.4
20	.957	.013	.917	.096	71.4	78.8	66.8	12.0
21	.988	.048	.946	.102	70.0	77.2	64.8	12.4
22	30.006	.069	.963	.106	70.1	78.4	63.2	15.2
23	.013	.071	.968	.103	69.9	78.0	63.4	14.6
24	*Sunday.*							
25	.017	.083	.972	.111	69.0	77.4	62.8	14.6
26	.034	.103	.993	.110	67.6	75.8	62.2	13.6
27	.045	.117	30.001	.116	66.7	74.4	60.0	14.4
28	.019	.090	29.952	.138	66.1	73.6	59.0	14.6
29	.014	.073	.974	.099	66.6	75.4	59.6	15.8
30	.067	.144	30.017	.127	65.6	73.7	57.8	15.9

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	75.4	5.9	72.4	8.9	0.785	8.45	2.79	0.75
2	73.6	6.1	70.5	9.2	.739	7.98	.74	.74
3	*Sunday.*							
4	73.7	4.2	71.6	6.3	.766	8.30	1.86	.82
5	76.0	3.4	74.3	5.1	.835	9.03	.59	.85
6	76.3	4.1	74.2	6.2	.832	8.98	.96	.82
7	75.9	2.7	74.5	4.1	.840	9.11	.27	.88
8	75.9	2 5	74.6	3.8	.843	.13	.18	.89
9	76.0	2.4	74.8	3.6	.849	.19	.12	.89
10	*Sunday.*							
11	72.4	2.2	71.3	3.3	.758	8.28	0.92	.90
12	71.4	2.3	70.2	3.5	.732	7.99	0.97	.89
13	70.3	4.3	68.1	6.5	.684	.44	1.76	.81
14	70.2	5.3	67.5	8.0	.670	.30	2.16	.77
15	71.2	2.3	70.0	3.5	.727	.94	0.96	.89
16	72.2	3.3	70.5	5.0	.739	8.05	1.41	.85
17	*Sunday.*							
18	70.1	5.9	67.1	8.9	.661	7.19	2.41	.75
19	66.2	6.3	63.0	9.5	.578	6.32	.31	.73
20	66 0	5.4	63.3	8.1	.584	.41	1.94	.77
21	64 1	5.9	61.1	8.9	.541	5.97	2.03	.75
22	63.5	6 6	60.2	9.9	.527	.79	.24	.72
23	64.4	5.5	61.6	8.3	.552	6.07	1.91	.76
24	*Sunday.*							
25	62.9	6.1	59.8	9.2	.520	5.73	2.03	.74
26	62.0	5.6	58.6	9.0	.499	.52	1.92	.74
27	60.8	5.9	57.3	9.4	.478	.29	.94	.73
28	60.4	5.7	57.0	9.1	.473	.24	.86	.74
29	61.1	5.5	57.8	8.8	.486	.38	.83	.75
30	59.7	5.9	56.2	9.4	.461	.12	.88	.73

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.923	30.047	29.822	0.225	71.3	79.0	62.4	16.6
1	.909	.042	.812	.230	71.2	78.4	61.9	16.5
2	.898	.037	.803	.234	70.9	78.2	61.2	17.0
3	.897	.031	.791	.240	70.1	77.6	60.2	17.4
4	.898	.017	.795	.222	69.4	77.0	59.5	17.5
5	.909	.022	.803	.219	69.2	76.9	58.8	18.1
6	.922	.053	.818	.235	69.0	77.0	57.8	19.2
7	.940	.075	.841	.234	69.2	77.4	57.8	19.6
8	.966	.113	.861	.252	71.3	79.4	63.0	16.4
9	.981	.144	.882	.262	73.3	81.3	67.0	14.3
10	.981	.136	.885	.251	74.8	82.8	68 2	14.6
11	.960	.120	.866	.254	76.7	85.2	70.4	14.8
Noon.	.936	.086	.838	.248	77.9	85.4	71.8	13.6
1	.909	.070	.816	.254	78.6	86.4	73.0	13.4
2	.888	.044	.789	.255	79.4	87.4	73 6	13.8
3	.878	.029	.775	.254	79.1	87.6	73.6	14.0
4	.873	.019	.777	.242	78.0	86.2	72.2	14.0
5	.884	.036	.779	.257	76.8	85.0	69.8	15.2
6	.893	.056	.785	.271	74.9	82.8	67.0	15.8
7	.910	.070	.808	.262	73.9	81.8	66.0	15.8
8	.925	.082	.828	.254	73.1	81.3	65.0	16.3
9	.934	.092	.848	.244	72.4	79 8	64.0	15.8
10	.939	.097	.845	.252	71.8	79.2	63.4	15.8
11	.939	.090	.840	.250	71.0	78.6	62.4	16.2

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Midnight.	68.5	2.8	67.1	4.2	0.661	7.26	1.07	0.87
1	68.4	2.8	67.0	4.2	.659	.24	.06	.87
2	68.2	2.7	66.8	4.1	.655	.20	.03	.88
3	67.4	2.7	66 0	4.1	.638	.02	.01	.88
4	66.6	2.8	65.2	4.2	.621	6.85	.01	.87
5	66.5	2.7	65.1	4.1	.619	.83	0.98	.88
6	66.4	2.6	65.1	3.9	.619	.83	.93	.88
7	66.6	2.6	65.3	3.9	.623	.87	.94	.88
8	67.5	3.8	65.6	5.7	.630	.92	1.41	.83
9	68.4	4.9	65.9	7.4	.636	.96	.88	.79
10	69.1	5.7	66.2	8.6	.642	.99	2.27	.76
11	69.8	6.9	66.3	10.4	.644	7.01	.79	.72
Noon.	70.1	7.8	66.2	11.7	.642	6.95	3.21	.68
1	70.4	8.2	66.3	12.3	.644	.98	.40	.67
2	70.7	8.7	66.3	13.1	.644	.96	.66	.66
3	70.7	8.4	66.5	12.6	.648	7.00	.53	.67
4	70.4	7.6	66.6	11.4	.651	.05	.14	.69
5	70.3	6.5	67.0	9.8	.659	.15	2.68	.73
6	70.4	4.5	68.1	6.8	486.	.44	1.84	.80
7	70.0	3.9	68.0	5.9	.681	.44	.57	.83
8	69.6	3 5	67.8	5.3	.677	.41	.38	.84
9	69.3	3.1	67.7	4.7	.674	.39	.21	.86
10	68.8	3.0	67.3	4.5	.666	.30	.15	.86
11	68.1	2.9	66 6	4.4	.651	.15	.10	.87

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	144.0	...	N. W. & N.	Scatd. _i till 8 A. M. cloudless afterwards.
2	130.0	...	N. & N. W.	Cloudless till 6 A. M. Scatd. \i afterwards.
3	*Sunday.*	...		
4	...	0.17	N. E. & N. W.	Cloudy; also drizzling at 3 & 4 P. M.
5	135.0	...	N. & E.	Scatd. clouds till 7 P. M. cloudless afterwards; also slightly drizzling at 7 P. M.
6	139.5	...	E. & N. E.	Scatd. _i till 11 A. M. Scatd. clouds till 8 P. M. cloudless afterwards.
7	...	...	N. E. & E.	Cloudy; also slightly drizzling at 1 P.M.
8	...	0.43	E. & S.	Cloudy; also raining between Noon & 1 P. M.
9	...	1.31	N. & E.	Cloudy; also constantly raining.
10	*Sunday.*	0.61		
11	...	1.02	N. E. & N.	Cloudy; also constantly raining between 1 & 10 A. M.
12	...	0.26	N. E. & N.	Cloudy till 8 P. M. cloudless afterwards; also constantly drizzling between 3 & 11 A. M.
13	129.0	...	N.	Cloudless till 4 A. M. Scatd. _i till 6 P. M. cloudless afterwards.
14	127.0	...	N.	Cloudless till 1 P. M. cloudy afterwards.
15	...	0.40	N.	Cloudy; also constantly drizzling between 2 A. M. & 3 P. M.
16	128.0	0.19	N. & N. E.	Cloudy; also drizzling at 5 & 8 A. M.
17	*Sunday.*	...		
18	139.4	...	N. & N. W.	Cloudy till 10 A. M. cloudless afterwards.
19	...	...	N. & N. W.	Cloudless.
20	137.2	...	N. & N. W.	Cloudless.
21	136.7	...	N. & W. & E.	Cloudless.
22	138.2	...	N. W. & N.	Cloudless.
23	134.0	...	N.	Cloudless.
24	*Sunday.*	...		
25	137.0	...	N. & W.	Cloudless.
26	132.0	...	N. W. & N. & W.	Cloudless.
27	134.5	...	W. & N. W. & N. E.	Cloudless.
28	134.6	...	N. W. & N. & W.	Cloudless.
29	135.0	...	N. & S. W.	Cloudless.
30	130.0	...	N.	Cloudless.

\i Cirri, _i Cirro strati, ^i Cumuli, ^i Cumulo strati, _i Nimbi, —1 Strati, ^i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ...	29.921
Max. height of the Barometer occurred at 9 A. M. on the 30th, ..	30.144
Min. height of the Barometer occurred at 3 P. M. on the 5th & 8th, ..	29.775
Extreme range of the Barometer during the month, ...	0.369
Mean of the daily Max. Pressures, ...	29.984
Ditto ditto Min. ditto, ...	29.872
Mean daily range of the Barometer during the month, ...	0.112

	°
Mean Dry Bulb Thermometer for the month, ...	73.5
Max. Temperature occurred at 3 P. M. on the 2nd, ...	87.6
Min. Temperature occurred at 6 & 7 A. M. on the 30th, ...	57.8
Extreme range of the Temperature during the month, ...	29 8
Mean of the daily Max. Temperature, ...	79.6
Ditto ditto Min. ditto, ...	68.9
Mean daily range of the Temperature during the month, ..	10.7

	°
Mean Wet Bulb Thermometer for the month, ...	68.9
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	4.6
Computed Mean Dew-point for the month, ...	66.6
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	6.9
	Inches
Mean Elastic force of Vapour for the month, ...	0.651

	Troy grains
Mean Weight of Vapour for the month, ...	7.11
Additional Weight of Vapour required for complete saturation, ..	1.79
Mean degree of humidity for the month, complete saturation being unity,	0.80

	Inches
Rained 10 days, Max. fall of rain during 24 hours, ...	1.31
Total amount of rain during the month, ...	4.39
Prevailing direction of the Wind, ...	N. & N. W.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.	15		2		4										3				2
1	17		2	1	4										3				
2	16	1	2	1	4										3				1
3	17	2	1		4										3				1
4	14	2	2	1	4										3				3
5	13	3	2	1	2		1	1							2				6
6	14	2	2		2		1	1			1		2		4				
7	14	2	2		2		1	1			1		2		4				
8	13	2	4	1	1		1	1			1		3		3				
9	14	1	3		3						1		2		3				
10	14	2	4		2						1		2		3				
11	13	2	5	1	2						1		1		3				1
Noon.	10	2	3		3	1					1		2		7				
1	7	1	4		3	2					1		5		6				
2	8		3		3						1		4		6				1
3	8	1	3	1	2		1				1		3		8				
4	9		4		1	1			1		1		1		8				1
5	11		5		1				1		1		1		5				1
6	11		6		2				1				2		4				
7	11		6	1	2	1			1				3		3				
8	10		7	1	2				1				3		3				
9	9		6		4	1			1				3		3				
10	10		4		4	1			1				3		3				1
11	10		5		2				1				3		3				2

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December, 1861.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11 Feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	*Sunday.*							
2	30.042	30.111	29.987	0.124	65.8	74.5	59.2	15.3
3	.033	.097	.973	.124	66.7	74.2	60.2	14.0
4	.047	.116	30.003	.113	67.1	75.4	60.8	14.6
5	.067	.132	.012	.120	67.1	75.6	60.2	15.4
6	.093	.164	.042	.122	66.9	75.4	59.6	15.8
7	.046	.124	29.968	.156	67.5	75.4	60.6	14.8
8	*Sunday.*							
9	.009	.075	.963	.112	69.6	79.4	61.8	17.6
10	.003	.096	.951	.145	70.5	76.6	66.0	10.6
11	29.955	.008	.902	.106	70.6	76.8	65.6	11.2
12	.956	.026	.904	.122	67.1	73.9	62.8	11.1
13	.961	.025	.923	.102	65.3	73.2	58.6	14.6
14	.978	.064	.923	.141	65.2	73.0	58.4	14.6
15	*Sunday.*							
16	.910	29.957	.850	.107	68.1	74.1	63.4	10.7
17	.940	30.027	.890	.137	66.5	73 0	62.2	10.8
18	.950	.024	.890	.134	66.0	73.8	60.8	13.0
19	.967	.022	.921	.101	65.7	73.8	59.6	14.2
20	.980	.039	.938	.101	65.0	73.4	58.8	14.6
21	30.044	.123	.965	.158	66.0	73.2	58.9	14.3
22	*Sunday.*							
23	29.994	.064	.947	.117	65.3	72.6	58.8	13.8
24	.997	.070	.952	.118	64.8	73.2	57.4	15.8
25	30.005	.070	.955	.115	64.4	73.6	57.8	15.8
26	.019	.088	.971	.117	65.1	74.8	57.0	17.8
27	.047	.118	30.004	.114	64.1	73.4	56.8	16.6
28	.021	.091	29.969	.122	65.6	74.7	57.2	17.5
29	*Sunday.*							
30	.065	.122	30.010	.112	67.4	75.6	61.4	14.2
31	.077	.152	.013	.139	66.2	74.2	60.4	13.8

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December, 1861.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	*Sunday.*							
2	61.1	4.7	58.3	7.5	0.494	5.47	1.57	0.78
3	61.9	4.8	59.0	7.7	.506	.60	.63	.78
4	62.3	4.8	59.4	7.7	.513	.67	.65	.78
5	62.1	5.0	59.1	8.0	.508	.62	.70	.77
6	62.2	4.7	59.4	7.5	.513	.67	.61	.78
7	62.8	4.7	60.0	7.5	.523	.78	.64	.78
8	*Sunday.*							
9	61.9	4.7	62.5	7.1	.568	6.26	.64	.79
10	66.4	4.1	64.3	6.2	.603	.64	.49	.82
11	67.4	3.2	65.8	4.8	.634	.97	.18	.86
12	62.0	5.1	58 9	8.2	.504	5.58	.74	.76
13	60.1	5.2	57.0	8.3	.473	.25	.68	.76
14	60.6	4.6	57.8	7.4	.486	.40	.51	.78
15	*Sunday.*							
16	65.1	3.0	63.3	4.8	.584	6.44	.11	.85
17	62.9	3.6	60.7	5.8	.536	5.93	.26	.83
18	61.2	4.8	58 3	7.7	.494	.47	.61	.77
19	60.0	5.7	56 6	9.1	.467	.18	.84	.74
20	59.9	5.1	56.8	8.2	.470	.23	.64	.76
21	60.4	5.6	57.0	9.0	.473	.24	.84	.74
22	*Sunday.*							
23	60.3	5.0	57.3	8.0	.478	.30	.63	.77
24	59.3	5.5	56.0	8.8	.458	.09	.74	.75
25	58.6	5.8	54.5	9.9	.435	4.84	.90	.72
26	59.1	6.0	55.5	9.6	.450	5.00	.89	.73
27	58.9	5.2	55.3	8.8	.447	4 98	.69	.75
28	60.2	5.4	57.0	8.6	.473	5.24	.76	.75
29	*Sunday.*							
30	62.4	5.0	59.4	8.0	.513	.67	.72	.77
31	60.8	5.4	57.6	8.6	.483	.34	.78	.75

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	30.013	30.089	29.916	0.173	63.5	68.8	60.0	8.8
1	.002	.089	.910	.179	62.8	68.4	59.2	9.2
2	29.991	.081	.901	.180	62.2	67.6	58.6	9.0
3	.983	.076	.890	.186	61.5	67.2	58.0	9.2
4	.983	.073	.887	.186	61.0	66.8	57.6	9.2
5	.986	.095	.902	.193	60.6	66.0	57.0	9.0
6	30.007	.102	.918	.184	60.3	66.0	56.8	9.2
7	.026	.130	.930	.200	60.4	66.2	57.2	9.0
8	.054	.144	.953	.191	63.1	68.2	59.4	8.8
9	.075	.162	.951	.211	65.9	70.3	62.8	7.5
10	.075	.164	.953	.211	68.0	72.8	64.5	8.3
11	.055	.143	.947	.196	70.7	74.0	68.4	5.6
Noon.	.029	.122	.908	.214	72.5	76 4	70.2	6.2
1	29.998	.077	.885	.192	73.6	78.2	71.4	6.8
2	.979	.056	.857	.199	74.4	79.4	72.6	6.8
3	.965	.045	.852	.193	74.2	79.0	72.2	6.8
4	.961	.042	.850	.192	72.8	76.6	71.0	5.6
5	.967	.045	.856	.189	71.1	74.8	68.6	6.2
6	.976	.062	.870	.192	68.9	72.9	66.4	6.5
7	.993	.078	.900	.178	67.3	71.4	64.8	6.6
8	30.009	.095	.915	.180	66.1	70.8	63.6	7.2
9	.021	.102	.933	.169	65.3	69.8	62.8	7.0
10	.027	.114	.927	.187	64.6	69.4	61.8	7.6
11	.022	.114	.926	.188	63.9	69.0	61.2	7.8

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December, 1861.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	60.8	2.7	58.9	4.6	0.504	5.61	0.94	0.86
1	60.2	2.6	58.4	4.4	.496	.54	.87	.86
2	59.8	2.4	58.1	4.1	.491	.49	.80	.87
3	59.2	2.3	57.6	3.9	.483	.40	.76	.88
4	58.7	2.3	56.9	4.1	.472	.28	.78	.87
5	58.4	2.2	56.6	4.0	.467	.24	.74	.88
6	58 2	2.1	56.5	3.8	.465	.22	.71	.88
7	58.4	2.0	56.8	3.6	.470	.27	.68	.89
8	60.2	2.9	58.2	4.9	.493	.49	.98	.85
9	61.5	4.4	58.9	7.0	.504	.59	1.47	.79
10	62.4	5.6	59.0	9.0	.506	.59	.94	.74
11	63.1	7.6	59.3	11.4	.511	.61	2.57	.69
Noon.	63.6	8.9	59.1	13.4	.508	.56	3.07	.64
1	64.1	9.5	59.3	14.3	.511	.58	.35	.63
2	64.2	10.2	59.1	15.3	.508	.54	.61	.61
3	64.1	10.1	59.0	15 2	.506	.52	.57	.61
4	63 8	9.0	59 3	13 5	.511	.58	.13	.64
5	63.9	7.2	60.3	10.8	.528	.80	2.48	.70
6	63.9	5.0	61.4	7.5	.548	6 04	1.70	.78
7	63.0	4.3	60.4	6.9	.530	5 87	.50	.80
8	62.5	3.6	60.3	5 8	.528	.86	.24	.83
9	62.0	3.3	60.0	5.3	.523	.81	.12	.84
10	61.6	3.0	59.8	4.8	.520	.77	.01	.85
11	61.0	2.9	59.0	4.9	.506	.63	.00	.85

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of Decembr, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	*Sunday.*			
2	136.7	...	N.	Cloudless till 11 A. M. Scatd. \i & _i till 4 P. M. cloudless afterwards.
3	131.4	...	W. & N.	Cloudless till 8 A. M. Scatd. \i & _i till 5 P. M. cloudless afterwards.
4	136.0	...	N. & N. W.	Cloudless; also foggy after 8 P. M.
5	135.0	...	N.	Cloudless.
6	130.0	...	N. & N. E.	Cloudless.
7	129.5	...	N. & N. E. & N. W.	Cloudless; also foggy after 7 P. M.
8	*Sunday.*			
9	139.4	...	N. E. & S.	Cloudless.
10	129.0	...	S. E. & E.	Scatd. _i.
11	...	...	S. & W. & N.	Scatd. clouds; also slightly raining at 9 A. M.
12	136.4	...	N. & N. W. & N. E.	Scatd. _i till 3 A. M. cloudless afterwards.
13	135.0	...	N.	Cloudless.
14	133.0	...	N.	Cloudless.
15	*Sunday.*			
16	...	0.26	S. & N.	Cloudless till 4 P. M. cloudy till 5 P. M. cloudless afterwards; also raining between 11 A. M. & Noon.
17	132.0	...	W. & S. W.	Scatd. _i till 4 A. M. cloudy till 10 A. M. Scatd. _i till 5 P. M. cloudless afterwards; also foggy after 8 P. M.
18	131.4	...	W. & N. E. & N. W.	Cloudless.
19	134.0	...	W. & S. W. & N. W.	Cloudless.
20	130.6	...	W. & N. W.	Cloudless.
21	131.2	...	N. W. & N. & N. E.	Cloudless; also foggy till 4 A. M.
22	*Sunday.*			
23	130.0	...	W. & N. W.	Cloudless.
24	131.6	...	N. W.	Cloudless.
25	134.8	...	W.	Cloudless; also foggy after 8 P. M.
26	136.0	...	N. & N. W. & S. W.	Cloudless.
27	135.5	...	W & E.	Cloudless.
28	134. 0	...	N. E. & E.	Cloudless.
29	*Sunday.*			
30	134.5	...	N. & N. E.	Cloudless.
31	135.0	...	N.	Cloudless till 6 A. M. Scatd \i & _i till 4 P. M. cloudless afterwards.

\i Cirri, _i Cirro strati, ∩i Cumuli, ∼i Cumulo strati, _i Nimbi, —i Strati, ∼i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December, 1861.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ..	30.008
Max. height of the Barometer occurred at 10 A. M. on the 6th,	30.164
Min. height of the Barometer occurred at 4 P. M. on the 16th,	29.850
Extreme range of the Barometer during the month, ..	0.314
Mean of the Daily Max. Pressures,	30.077
Ditto ditto Min. ditto, ...	29.955
Mean daily range of the Barometer during the month,	0.122

	o
Mean Dry Bulb Thermometer for the month,	66.5
Max. Temperature occurred at 2 P. M. on the 9th,	79.4
Min. Temperature occurred at 6 A. M. on the 27th,	56.8
Extreme range of the Temperature during the month,	22.6
Mean of the daily Max. Temperature, ..	74.5
Ditto ditto Min. ditto, ..	60.2
Mean daily range of the Temperature during the month,	14.3
Mean Wet Bulb Thermometer for the month,.. ..	61.7
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,	4.8
Computed Mean Dew-point for the month, ...	58.8
Mean Dry Bulb Thermometer above computed Mean Dew-point,	7.7

	Inches
Mean Elastic force of Vapour for the month,	0.503

	Troy grains
Mean Weight of Vapour for the month,	5.56
Additional Weight of Vapour required for complete saturation,	1.63
Mean degree of humidity for the month, complete saturation being unity,	0.77

	Inches
Rained 2 days, Max. fall of rain during 24 hours,	0.26
Total amount of rain during the month,	0.26
Prevailing direction of the Wind, ..	N. & W.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December, 1861.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.	8		4		2				1		1		5		3				2
1	9		4		2				1		1		5		4				
2	9		4		1				2		1		5		4				
3	8		3		1				1		2		4		4				3
4	9		2		2				1		1		4		4				3
5	9		3		2				1		2		4		3				2
6	11		4		2				2		2		3		2				
7	10		3		3				2		1		5		2				
8	6		5		1				2				4		1				7
9	5		8		3				2	1			5		3				
10	6		7		3				2		1		4		3				
11	5		8		3				1				6		3				
Noon.	5		4		4		1		1	1	1		7		3				
1	4		3		2		2		1		1		5		8				
2	4		4		3				1		1		8		5				
3	4		4		2		1				1		6		8				
4	6		2		1		1		1		1		4		8				2
5	10		2		1		1		3		1		5		2				1
6	10		2		1		1		3		1		6		2				
7	10		3		1		1		2				5		4				
8	10		3		1		1		2				5		4				
9	11		3		1		1		1				5		4				
10	11		4				1		1				4		4				1
11	11		4				1		1				5		4				

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January, 1862.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	30.037	30.099	29.981	0.118	65.5	74.8	59.0	15.8
2	.044	.108	.985	.123	65.7	74.3	59.2	15.1
3	.099	.183	30.053	.130	65.5	74.6	58.4	16 2
4	.086	.152	.040	.112	65.5	74.8	58.0	16.8
5	*Sunday.*							
6	.003	.080	29.953	.127	66.3	75.8	58.8	17.0
7	29.987	.076	.929	.147	67.3	77.8	58.4	19.4
8	.933	.035	.870	.165	69.7	78.0	62.6	15.4
9	.881	29.938	.818	.120	70.9	75.4	67.2	8.2
10	.931	.996	.882	.114	69.7	76.8	65.8	11.0
11	30.019	30.093	.940	.153	67.1	75.4	61.6	13.8
12	*Sunday.*							
13	.006	.074	.956	.118	67.9	74.4	62.4	12.0
14	.048	.112	30.000	.112	68.1	75.4	60.8	14.6
15	.059	.140	.009	.131	69.1	76 8	62.0	14.8
16	.048	.126	29.996	.130	70.4	78.3	65.8	12.5
17	.046	.110	.994	.116	67.4	69.2	65.2	4.0
18	.072	.150	30.035	.115	67.0	74.2	62.8	11.4
19	*Sunday.*							
20	.084	.167	.028	.139	62.7	71.8	55·2	16.6
21	.055	.126	29.982	.144	63.9	73.8	55·7	18.1
22	.074	.145	30.034	.111	67.1	77.4	58·2	19.2
23	.055	.131	.011	.120	68.4	77.2	60·6	16.6
24	.026	.112	29.972	.140	68.6	76.8	63 .3	13.5
25	29.991	.088	.925	.163	69.2	76.7	62.2	14.5
26	*Sunday.*							
27	.828	29.894	.768	.126	69.8	74.0	66.2	7.8
28	.907	.990	.858	.132	65.7	72.0	59.5	12.5
29	.975	30.046	.928	.118	62.6	71.6	55.2	16.4
30	.980	.062	.924	.138	63.7	73.2	55.4	17.8
31	.955	.025	.908	.117	65.2	75.6	56.4	19.2

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January, 1862.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	60.3	5.2	57.2	8.3	0.476	5.28	1.70	0.76
2	59.6	6.1	55.9	9.8	.456	.06	.96	.72
3	59.9	5.6	56.5	9.0	.465	.17	.81	.74
4	60.3	5.2	57.2	8.3	.476	.28	.70	.76
5	*Sunday.*							
6	60.5	5.8	57.0	9.3	.473	.24	.91	.73
7	62.6	4.7	59.8	7.5	.520	.74	.63	.78
8	66.1	3.6	64.3	5.4	.603	6.65	.28	.84
9	67.1	3.8	65.2	5.7	.621	.83	.40	.83
10	64.5	5.2	61.9	7.8	.557	.13	.80	.77
11	61.9	5.2	58.8	8.3	.503	5.56	.76	.76
12	*Sunday.*							
13	63.3	4.6	60.5	7.4	.532	.89	.62	.78
14	63.2	4.9	60.3	7.8	.528	.84	.71	.77
15	64.6	4.5	62.3	6.8	.565	6.22	.56	.80
16	66.0	4.4	63.8	6.6	.593	.52	.58	.81
17	65.0	2.4	63.6	3.8	.590	.52	0.87	.82
18	63.1	3.9	60.8	6.2	.537	5.95	1.35	.82
19	*Sunday.*							
20	56.9	5.8	52.8	9.9	.411	4.59	.80	.72
21	57.8	6.1	53.5	10.4	.421	.69	.94	.71
22	60.5	6.6	56.5	10.6	.465	5.14	2.18	.70
23	62.9	5.5	59.6	8.8	.516	.70	1.92	.75
24	63.4	5.2	60.8	7.8	.537	.92	.75	.77
25	63.8	5.4	61.1	8.1	.543	.98	.83	.77
26	*Sunday.*							
27	61.9	4.9	62.4	7.4	.567	6.24	.71	.79
28	57.9	7.8	53.2	12.5	.416	4.62	2.40	.66
29	56.0	6.6	51.4	11.2	.392	.38	1.99	.69
30	56.8	6.9	52.0	11.7	.400	.45	2.14	.68
31	58.9	6.3	55.1	10.1	.444	.94	1.97	.72

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the urveyor General's Office, Calcutta, in the month of January, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	30.010	30.104	29.817	0.287	64.0	71.6	58.6	13.0
1	.002	.096	.799	.297	63.3	71.2	57.9	13.3
2	29.999	.085	.779	.306	62.9	71.6	57.0	14.6
3	.986	.076	.768	.308	62.5	70.6	56.5	14.1
4	.995	.068	.866	.202	61.2	67.0	56.3	10.7
5	.987	.081	.799	.282	61.5	69.2	55.7	13.5
6	30.003	.098	.818	.280	61.0	69.0	55.6	13.4
7	.022	.113	.833	.280	60.8	68.5	55.2	13.3
8	.056	.164	.867	.297	62.0	67.0	57.0	10.0
9	.082	.180	.885	.295	65.8	72.0	61.2	10.8
10	.081	.183	.894	.289	68.0	72.6	63.6	9.0
11	.066	.159	.880	.279	70.5	74.6	66.4	8.2
Noon.	.039	.134	.867	.267	72.3	76.4	67.0	9.4
1	.006	.091	.840	.251	73.7	78.0	67.0	11.0
2	29.983	.068	.814	.254	74.5	77.5	68.4	9.1
3	.963	.058	.797	.261	74.7	78.3	68.8	9.5
4	.958	.040	.783	.257	73.5	76.2	69.2	7.0
5	.965	.053	.793	.260	72.2	75.0	68.6	6.4
6	.971	.058	.787	.271	69.9	72.7	66.2	6.5
7	.989	.073	.807	.266	68.1	71.4	64.0	7.4
8	30.005	.092	.846	.246	66.9	69.8	62.4	7.4
9	.016	.106	.854	.252	66.0	69.4	62.0	7.4
10	.025	.107	.860	.247	65.1	69.3	61.5	7.8
11	.025	.105	.868	.237	64.5	69.0	60.4	8.6

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Midnight.	61.2	2.8	59.2	4.8	0.509	5.67	0.98	0.85
1	60.7	2.6	58.9	4.4	.504	.62	.89	.86
2	60.4	2.5	58.6	4.3	.499	.58	.85	.87
3	60.1	2.4	58.4	4.1	.496	.54	.81	.87
4	58.6	2.6	56.5	4.7	.465	.21	.89	.85
5	59.1	2.4	57.4	4.1	.480	.37	.79	.87
6	58.5	2.5	56.5	4.5	.465	.21	.85	.86
7	58.3	2.5	56.3	4.5	.462	.18	.84	.86
8	58.5	3.5	56.0	6.0	.458	.12	1.13	.82
9	60.8	5.0	57.8	8.0	.486	.39	.65	.77
10	61.6	6.4	57.8	10.2	.486	.37	2.16	.71
11	62.5	8.0	58.5	12.0	.498	.47	.66	.67
Noon.	63.3	9.0	58.8	13.5	.503	.49	3.09	.64
1	63.8	9.9	58.8	14.9	.503	.48	.48	.61
2	64.1	10.4	58.9	15.6	.504	.49	.69	.60
3	64.3	10.4	59.1	15.6	.508	.53	.70	.60
4	64.2	9.3	59.5	14.0	.515	.62	.28	.63
5	64.0	8.2	59.9	12.3	.521	.71	2.84	.67
6	64.1	5.8	61.2	8.7	.544	.99	1.99	.75
7	63.5	4.6	60.7	7.4	.536	.92	.63	.78
8	63.0	3.9	60.7	6.2	.536	.93	.35	.82
9	62.4	3.6	60.2	5.8	.527	.84	.24	.83
10	61.8	3.3	59.8	5.3	.520	.77	.12	.84
11	61.5	3.0	59.7	4.8	.518	.76	.00	.85

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General aspect of the Sky.
	o	Inches.		
1	123.0	...	N.	Cloudless.
2	132.4	...	N. & N. W.	Cloudless.
3	135.4	...	N.	Cloudless.
4	134.0	...	N. & E.	Cloudless; also foggy after 8 P. M.
5	*Sunday.*			
6	134.0	...	N.	Cloudless; also foggy after 7 P. M.
7	134.0	...	S. & N.	Cloudless; also slightly foggy at 6 A. M.
8	116.0	...	S. & E.	Cloudless till 6 A. M. Scatd. ⌐i till 2 P. M. cloudy afterwards.
9	114.0	...	S. & W.	Cloudy till 4 P. M. Scatd. ⌐i afterwards.
10	135.0	...	E. & S. W.	Cloudy till 7 A. M. Scatd. ⌐i till 2 P. M. cloudless afterwards.
11	130.5	...	N. & N. E. & E.	Cloudless till 7 A. M. Scatd. clouds till 11 A. M. cloudless afterwards.
12	*Sunday.*			
13	136.0	...	W. & E.	Scatd. clouds till 3 P. M., cloudless afterwards; also drizzled at Midnight.
14	134.0	...	E. & N. E.	Cloudless till 1 P.M. Scatd. ⌐i afterwards.
15	132.0	...	E. & S. W. & S. E.	Cloudless till 11 A. M. cloudy afterwards; also drizzling at 5 & 7 P. M.
16	137.4	0.36	N. E. & N. W.	Cloudy, also raining from 5 to 7 P. M.
17	...	0.20	S. & E.	Cloudy till 7 P. M. cloudless afterwards; also drizzling at Midnight & from 8 A. M to Noon.
18	130.0	...	N. & N. W.	Cloudless till 3 A. M. cloudy till 8 A. M. cloudless afterwards; also drizzling at 4 A. M.
19	*Sunday.*			
20	126.0	...	S. W. & N.	Cloudless.
21	137.0	...	N.	Cloudless.
22	132.2	...	N. & W.	Cloudless.
23	134.0	...	N. & E.	Cloudless; also foggy from 9 to 11 P. M.
24	136.4	...	N. & E. & N. W.	Cloudless.
25	131.2	...	N.	Cloudless.
26	*Sunday.*	0.47		
27	...	...	N. & N. W.	Cloudy till Noon. Scatd. ⌐i & ⌒i till 6 P. M. cloudless afterwards; also drizzling at 5 A. M.
28	125.0	...	N & N. W.	Cloudless till 11 A. M. Scatd. ⌐i till 6 P. M. cloudless afterwards.
29	127.0	...	N.	Cloudless.
30	132.0	...	N. W. & N.	Cloudless; also foggy from 8 to 11 P. M.
31	129.0	...	N. & variable.	Cloudless.

⌐i Cirri, ⌐i Cirro strati, ⌒i Cumuli, ⌒i Cumulo strati, ⌐i Nimbi, —i Strati, ⌒i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January, 1862.

Monthly Results.

	Inches.
Mean height of the Barometer for the month, ...	30.009
Max. height of the Barometer occurred at 10 A. M. on the 3rd, ..	30.183
Min. height of the Barometer occurred at 3 A. M. on the 27th, ..	29.768
Extreme range of the Barometer during the month, ...	0.415
Mean of the daily Max. Pressures, ...	30.084
Ditto ditto Min. ditto, ...	29.955
Mean daily range of the Barometer during the month, ...	0.129

	o
Mean Dry Bulb Thermometer for the month, ...	67.0
Max. Temperature occurred at 3 P. M. on the 16th, ...	78.3
Min. Temperature occurred at 7 A. M. on the 20th & 29th, ..	55.2
Extreme range of the Temperature during the month, ...	23 1
Mean of the daily Max. Temperature, ...	75.0
Ditto ditto Min. ditto, ...	60.6
Mean daily range of the Temperature during the month, ..	14.4

	o
Mean Wet Bulb Thermometer for the month, ...	61.8
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,..	5.2
Computed Mean Dew-point for the month, ...	58.7
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	8.3
	Inches
Mean Elastic force of Vapour for the month,..	0.501

	Troy grains
Mean Weight of Vapour for the month, ...	5.55
Additional Weight of Vapour required for complete saturation, ..	1.75
Mean degree of humidity for the month, complete saturation being unity,	0.76

	Inches
Rained 7 days, Max. fall of rain during 24 hours, ...	0.47
Total amount of rain during the month, ...	1.03
Prevailing direction of the Wind, ...	N.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January, 1862.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.	15	1	1		6	1			1		1		1		1				1
1	16		1		6				1		1		1		1				
2	14		1		7				1		1		1		1				1
3	14		1		6				1		1		1		2				1
4	15	1	1		5						1		1		1				3
5	13		1		4				1		1		1		4	1			2
6	14		2		3				1		2		1		4				
7	13		1		3		1		1		3		1		4				
8	11		1		1						1	1	1		2				10
9	12		3		4	1			2		1		2		2				1
10	13		2		3	1	2		3		1		1		2				
11	11		2		2	1	2		2		1		3		4				
Noon.	10	1	3		1		1		2		1		3		6				
1	10		1		2		4		1		1		2		6				
2	9		1		2		2		2		1		4		6				
3	7		1		2		2		2				7		6				
4	8				2		1		2		5		1		6				2
5	11		1		2		1		3		3	1	1		5	1			
6	10				5				3		4		1		4	1			
7	12				5				3		4	1	1		2	1			
8	12		1		5				3		3		1		2				
9	12		1		5				3		3		1		2				
10	12		2		4				3		1		1		3				1
11	11		2		6				2		1		1		2				2

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February, 1862.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11 Feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.923	30.000	29.875	0.125	69.6	79.4	60.0	19.4
2	*Sunday.*							
3	.903	29.990	.848	.142	68.4	77.2	60.0	17.2
4	.899	.957	.852	.105	69.5	78 2	62 8	15.4
5	.960	30.046	.914	.132	67.9	78.0	59.0	19.0
6	.998	.072	.947	.125	66.6	76.6	58.4	18.2
7	30.009	.090	.935	.155	65.5	76.2	56.4	19.8
8	.004	.081	.952	.129	66.7	77.0	56.6	20.4
9	*Sunday.*							
10	.040	.114	.974	.140	72.6	83.4	63.7	19.7
11	.061	.130	30.018	.112	72 7	82.6	63.8	18.8
12	.088	.177	.028	.149	72.5	83.4	63.4	20.0
13	.043	.132	29.979	.153	73.0	83.8	63.6	20.2
14	.015	.104	.946	.158	74.6	85.2	64.2	21.0
15	29.967	.031	.919	.112	75.5	83.4	70.0	13.4
16	*Sunday.*							
17	.923	29.992	.874	.118	76.7	85.4	69.2	16.2
18	.930	30.002	.880	.122	75.6	83.8	67.6	16.2
19	.939	.002	.875	.127	75.7	84.6	68.0	16.6
20	.918	29.998	.834	.164	74.3	83.8	66.0	17.8
21	.850	.919	.782	.137	75.4	84.2	69.0	15.2
22	.856	.943	.799	.144	76.6	85.5	70.3	15.2
23	*Sunday.*							
24	.865	.932	.815	.117	77.4	85.6	70.6	15.0
25	.844	.917	.774	.143	78.3	87.4	72.8	14.6
26	.749	.822	.665	.157	78.0	88.8	70.4	18.4
27	.679	.755	.620	.135	79.9	91.0	72 4	18.6
28	.741	.811	.647	.164	79.9	89.6	73.6	16.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February, 1862.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	63.9	5.7	61.0	8.6	0.541	5.95	1.95	0.75
2	*Sunday.*							
3	61.1	7.3	56.7	11.7	.467	.16	2.46	.68
4	64.2	5.3	61.5	8.0	.550	6.06	1.82	.77
5	59.7	8.2	54.8	13.1	.440	4.85	2.66	.65
6	57.7	8.9	52.4	14.2	.405	.49	.72	.62
7	57.2	8.3	52.2	13.3	.402	.47	.51	.64
8	59.2	7.5	54.7	12.0	.438	.85	.38	.67
9	*Sunday.*							
10	64.7	7.9	60.7	11.9	.536	5.86	2.80	.68
11	65.7	7.0	62.2	10.5	.563	6.15	.53	.71
12	65.7	6.8	62.3	10.2	.565	.18	.45	.72
13	66.3	6.7	62.9	10.1	.576	.30	.46	.72
14	67.0	7.6	63.2	11.4	.582	.35	.85	.69
15	68.4	7.1	64.8	10.7	.613	.68	.78	.71
16	*Sunday.*							
17	68.1	8.6	63.8	12.9	.593	.44	3.36	.66
18	66.5	9.1	61.9	13 7	.557	.06	.42	.64
19	67.9	7.8	64.0	11 7	.597	.49	.02	.68
20	66.3	8.0	62.3	12 0	.565	.16	2.96	.68
21	69.7	5 7	66.8	8.6	.655	7.13	.30	.76
22	71.2	5.4	68.5	8.1	.692	.53	.24	.77
23	*Sunday.*							
24	71.4	6.0	68.4	9.0	.690	.48	.53	.75
25	71.6	6.7	68.2	10.1	.686	.43	.85	.72
26	71.4	6.6	68.1	9.9	.684	.40	.79	.73
27	73.3	6.6	70.0	9.9	.727	.84	.94	.73
28	73.7	6.2	70.6	9.3	.741	8.00	.78	.74

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.927	30.096	29.664	0.432	68.9	76.6	60.4	16.2
1	.923	.087	.662	.425	68 2	75.8	59.0	16.8
2	.913	.077	.655	.422	67.8	75.0	58.4	16.6
3	.907	.074	.649	.425	67.4	74.6	57.9	16.7
4	.905	.072	.647	.425	66.8	74.0	57.2	16.8
5	.916	.084	.672	.412	66.4	73.6	57.4	16.2
6	.931	.099	.683	.416	65.8	73.6	56.4	17.2
7	.949	.119	.706	.413	65.8	74.0	56.4	17.6
8	.972	.139	.722	.417	68.9	75.8	58.6	17.2
9	.997	.172	.754	.418	72.0	78.6	64.6	14.0
10	.999	.177	.755	.422	75.0	81.6	68.4	13.2
11	.985	.167	.738	.429	77.9	85.6	70.0	15.6
Noon.	.957	.132	.722	.410	79.9	87.6	72.8	14·8
1	.925	.096	.687	.409	81.4	89.0	74.6	14.4
2	.900	.067	.660	.407	82.4	90.6	75.6	15.0
3	.881	.049	.648	.401	83.0	91.0	76.2	14.8
4	.871	.035	.620	.415	82.0	89.7	75 4	14.3
5	.875	.028	.623	.405	80 6	87.0	74.3	12.7
6	.875	.029	.633	.396	77.3	84 0	70.0	14.0
7	.893	.048	.642	.406	75.0	82.0	67.2	14.8
8	.914	.062	.663	.399	73.8	80.2	65 6	14.6
9	.925	.075	.683	.392	72.5	79.0	64.4	14.6
10	.928	.090	.685	.405	71.4	77.8	63 0	14.8
11	.926	.096	.690	.406	70.5	77.6	62.2	15.4

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	65.3	3.6	63.5	5.4	0.588	6.48	1.26	0.84
1	64.7	3.5	62.6	5.6	.570	.29	.29	.83
2	64.6	3.2	62.7	5.1	.572	.33	.15	.85
3	64.2	3.2	62.3	5.1	.565	.25	.14	.85
4	63.8	3.0	62.0	4.8	.559	.19	.07	.85
5	63.4	3.0	61.6	4.8	.552	.11	.06	.85
6	63.1	2.7	61.5	4.3	.550	.11	0.93	.87
7	63.0	2.8	61.3	4.5	.546	.06	.98	.86
8	64.4	4.5	62.1	6.8	.561	.18	1.56	.80
9	65.8	6.2	62.7	9.3	.572	.27	2.23	.74
10	66.9	8.1	62.8	12.2	.574	.26	3.05	.67
11	67.7	10.2	62.6	15.3	.570	.18	.98	.61
Noon.	67.6	12.3	61.4	18.5	.548	5.91	4.87	.55
1	68.0	13.4	61.3	20.1	.546	.88	5.39	.52
2	67.9	14.5	60.6	21.8	.534	.72	.89	.49
3	68.1	14.9	60.6	22.4	.534	.72	6.10	.48
4	68.2	13 8	61.3	20.7	.546	.86	5.61	.51
5	68.5	12.1	62.4	18.2	.567	6.10	4 91	.55
6	68.9	8.4	64.7	12.6	.611	.62	3.36	.66
7	68.2	6.8	64.8	10.2	.613	.69	2.62	.72
8	68.1	5.7	65.2	8 6	.621	.79	.19	.76
9	67.6	4.9	65.1	7.4	.619	.79	1.84	.79
10	67.1	4.3	64.9	6.5	.615	.75	.60	.81
11	66.5	4.0	64.5	6.0	.607	.68	.45	.82

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	138 4	...	N. & N. E. & W.	Cloudless.
2	*Sunday.*			
3	136.0	...	N. & N. W.	Cloudless.
4	134.0	...	W. & N. W.	Cloudless till 4 A. M. Scatd. clouds till 3 P. M. cloudless afterwards.
5	137.0	...	N. & W.	Cloudless; also foggy after 9 P. M.
6	136.0	...	W. & N. W. & N.	Cloudless; also foggy between 9 & 11 P. M.
7	128.0	...	W. & N. W.	Cloudless.
8	127.0	...	W. & N. W.	Cloudless.
9	*Sunday.*			
10	140.0	...	E. & N.	Cloudless till 11 A. M. Scatd. i till 9 P. M. cloudless afterwards.
11	134.0	...	S. & S. W.	Cloudless.
12	132.0	...	N. & W. & S.	Cloudless.
13	137.8	...	E. & N. W. & S.	Cloudless; also foggy between 8 & 10 P. M.
14	135.0	...	N. & S.	Cloudless till 4 A. M. Scatd. ⌣i afterwards.
15	...	...	S. & W.	Scatd. ⌣i till 4 A. M. cloudy afterwards.
16	*Sunday.*			
17	134.0	...	W. & N. W.	Scatd. ⌣i till 3 P. M. cloudless afterwards.
18	134.0	...	N. & N. E.	Scatd. ⌣i & ∩i till 6 A. M. cloudless afterwards.
19	135.4	...	S. W. & S. E.	Cloudless till 11 A. M. Scatd. ∩i till 6 P. M. cloudless afterwards.
20	137.0	...	W. & N. & S.	Cloudless.
21	134.7	...	S.	Cloudy and foggy till 9 A. M. Scatd. ∩i till 5 P. M. cloudless afterwards.
22	134.5	...	S.	Scatd. clouds till 4 P. M. cloudless afterwards.
23	*Sunday.*			
24	135.4	...	S. W. & S. & W.	Cloudless.
25	138 0	...	S.	Cloudless.
26	138.0	...	S.	Cloudless till 11 A. M. Scatd. \i till 3 P. M. cloudless afterwards.
27	141.6	...	S.	Cloudless.
28	140.0	...	S.	Cloudless.

\i Cirri, ⌣i Cirro strati, ∩i Cumuli, ∿i Cumulo strati, ⌣i Nimbi, —i Strati, \i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February, 1862.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ..	29.925
Max. height of the Barometer occurred at 10 A. M. on the 12th,	30.177
Min. height of the Barometer occurred at 4 P. M. on the 27th,	29.620
Extreme range of the Barometer during the month, ..	0.557
Mean of the Daily Max. Pressures,	30.001
Ditto ditto Min. ditto, ...	29.865
Mean daily range of the Barometer during the month,	0.136

	o
Mean Dry Bulb Thermometer for the month,	73.4
Max. Temperature occurred at 3 P. M. on the 27th,	91.0
Min. Temperature occurred at 6 & 7 A. M. on the 7th,	56.4
Extreme range of the Temperature during the month,	34.6
Mean of the daily Max. Temperature, ..	83.1
Ditto ditto Min. ditto, ..	65.5
Mean daily range of the Temperature during the month,	17.6
Mean Wet Bulb Thermometer for the month, ...	66.3
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,	7.1
Computed Mean Dew-point for the month, ...	62.7
Mean Dry Bulb Thermometer above computed Mean Dew-point,	10.7

	Inches
Mean Elastic force of Vapour for the month,	0.572

	Troy grains
Mean Weight of Vapour for the month,	6.25
Additional Weight of Vapour required for complete saturation,	2.62
Mean degree of humidity for the month, complete saturation being unity,	0.71

	Inches
Rained no days, Max. fall of rain during 24 hours,	Nil.
Total amount of rain during the month,	Nil.
Prevailing direction of the Wind, ..	S. & W.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February, 1862.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
	No. of days.																		
Midnight.	6	1					1		7				2		3				4
1	6	1					1		7				5		3				1
2	5	1					1		9				5		3				
3	5	1					1		9				5		3				
4	4	1					1		9				5		3				1
5	5	1							8				4		2				4
6	6						1		11		1		3		2				
7	4	2					2		10		1		3		2				
8	2				2		1		6		1		3		3				6
9	2	4			3		2		8		1		3		1				
10	3	3			3		1		7		3		2		2				
11	3	2			1		1		6		4		5		2				
Noon.	4	1			3				3		4		6		3				
1	2				2		1		2		5		6		6				
2	2	1			3				2		2		9		5				
3	2	1			3				2		4		8		4				
4	3				1		1		5		3		6		2				3
5	3	1			1		1		5		1		8		3				1
6	3	1			1				7		2		5		3				2
7	3	1			1				7		3		6		2				1
8	3	1			1				8		3		5		2				1
9	3	1			2				8		3		4		3				
10	3	1			2				8		3		4		3				
11	3	1			2				9		2		3		3				1

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March, 1862.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Faht.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.732	29.820	29.660	0.160	81.7	91.2	76.0	15.2
2	*Sunday.*							
3	.920	.999	.845	.154	73.7	83.2	66.2	17.0
4	.957	30.035	.907	.128	73.7	84.0	64.5	19.5
5	.946	.027	.869	.158	75.3	85.8	67.0	18.8
6	.899	29.977	.838	.139	77.6	86.0	71.2	14.8
7	.962	30.047	.891	.156	79.0	87.4	72.3	15 1
8	.984	.056	.909	.147	80.0	88.2	72.8	15.4
9	*Sunday.*							
10	.862	29.949	.789	.160	78.4	87.6	71.8	15 8
11	.864	.944	.787	.157	76.6	83.2	71.6	11.6
12	.958	30.045	.900	.145	76.2	83.8	69.2	14.6
13	.969	.055	.907	.148	75.9	84.7	67.0	17.7
14	30.006	.115	.940	.175	76 1	86.6	66.4	20.2
15	29.997	.087	.934	.153	78.2	88.8	69.2	19.6
16	*Sunday.*							
17	.905	29.981	.866	.115	79.8	91.6	71.6	20.0
18	.894	.963	.845	.118	79.8	90.4	71.6	18.8
19	.932	30.011	.879	.132	78.9	89.2	69.8	19.4
20	.907	29.990	.824	.166	77.8	89.5	67.6	21.9
21	.845	.924	.770	.154	79.5	91.8	68.8	23.0
22	.831	.912	.762	.150	81.2	94.6	69.0	25.6
23	*Sunday.*							
24	.869	.941	.810	.131	81.0	90.4	73.0	17.4
25	.924	30.003	.874	.129	82 6	91.6	74.9	16.7
26	.862	29.933	.783	.150	82.0	91.0	75.2	15.8
27	.807	.882	.735	.147	82.1	89.6	75.4	14.2
28	.858	.919	.782	.137	82.4	92.4	73.8	18 6
29	.852	.944	.720	.224	74.0	86.0	64.5	21.5
30	*Sunday.*							
31	.859	.927	.798	.129	75.8	86 6	66.8	19.8

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March, 1862.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	75.5	6.2	72.4	9.3	0.785	8.45	2.92	0.74
2	*Sunday.*							
3	62.8	10.9	57.3	16.4	.478	5.22	3.74	.58
4	62.7	11.0	57.2	16.5	.476	.19	.77	.58
5	68.2	7.1	64.6	10.7	.609	6.63	2.77	.71
6	72.3	5.3	69.6	8.0	.717	7.77	.30	.77
7	73.3	5.7	70.4	8.6	.736	.95	.55	.76
8	74.2	5.8	71.3	8.7	.758	8.18	.63	.76
9	*Sunday.*							
10	72.8	5.6	70.0	8 4	.727	7.87	.44	.76
11	70.9	5.7	68.0	8.6	.681	.39	.38	.76
12	66.6	9.6	61.8	14.4	.555	6.04	3.62	.63
13	65.8	10.1	60.7	15.2	.536	5.82	.75	.61
14	66.3	9.8	61.4	14.7	.548	.96	.67	.62
15	67.4	10.8	62.0	16.2	.559	6.05	4.20	.59
16	*Sunday.*							
17	69.1	10.7	63.7	16.1	.591	.38	.37	.59
18	68.6	11.2	63 0	16.8	.578	.23	.52	.58
19	66.7	12 2	60.6	18 3	.534	5.76	.71	.55
20	65.8	12.0	59.8	18.0	.520	.62	.51	.56
21	66.9	12.6	60.6	18.9	.534	.75	.91	.54
22	69.0	12 2	62.9	18.3	.576	6.20	5.01	.55
23	*Sunday.*							
24	71.2	6 8	70.8	10.2	.746	8.04	3.10	.72
25	74.4	8.2	70.3	12.3	.734	7.89	.79	.68
26	74.8	7.2	71.2	10.8	.756	8.12	.35	.71
27	75.7	6.4	72.5	9.6	.787	.46	.05	.74
28	72 2	10.2	67.1	15.3	.661	7.10	4.51	.61
29	69.6	4.4	67.4	6.6	.668	.29	1.75	.81
30	*Sunday.*							
31	68.7	7.1	65.1	10.7	.619	6.74	2.80	.71

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorologieal Observations taken at the Surveyor General's Offiee, Calcutta, in the month of Mareh, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fabt.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Tempera ture for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.898	29.998	29.810	0.188	73.6	78.2	68.0	10.2
1	.885	.993	.770	.223	73.1	77.4	67.4	10.0
2	.880	.990	.748	.242	72.8	77.2	67.0	10.2
3	.880	.988	.742	.246	72.1	76.8	65.8	11.0
4	.873	.983	.731	.252	71.3	76.2	65.4	10.8
5	.894	30.001	.737	.264	70.9	76.4	65.2	11.2
6	.912	.023	.755	.268	70.7	76.4	64.5	11.9
7	.931	.046	.763	.283	71.3	77.6	64.8	12.8
8	.957	.088	.802	.286	75.3	81.0	69.4	11.6
9	.975	.104	.812	.292	78.3	84.6	70.4	14.2
10	.977	.115	.820	.295	80.8	86.0	73.0	13.0
11	.967	.103	.798	.305	83.8	88.4	78.6	9.8
Noon.	.942	.077	.750	.327	85.4	90.6	80.5	10.1
1	.911	.041	.724	.317	86.4	91.6	77.2	14.4
2	.880	.010	.682	.328	87.0	93.2	73.2	20.0
3	.857	29.980	.663	.317	87.5	94.6	75.8	18.8
4	.845	.970	.661	.309	87.0	93.2	73.5	19.7
5	.840	.946	.660	.286	85.4	91.2	76.6	14.6
6	.847	.944	.671	.273	82.4	86.6	75.6	11.0
7	.863	.949	.678	.271	79.7	84.0	66.2	17.8
8	.883	.992	.691	.301	77.9	82.0	64.5	17.5
9	.898	30.003	.714	.289	76.4	80.2	64.6	15.6
10	.905	.009	.726	.283	75.5	79.8	65.0	14.8
11	.901	.003	.728	.275	74.5	79.0	64.8	14.2

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	68.8	4.8	66.4	7.2	0.646	7.07	1.86	0.79
1	68.8	4.3	66.6	6 5	.651	.11	.68	.81
2	68.6	4.2	66.5	6.3	.648	.10	.61	.82
3	68.0	4.1	65.9	6.2	.636	6.98	.55	.82
4	67.5	3 8	65.6	5.7	.630	.92	.41	.83
5	66.9	4.0	64.9	6.0	.615	.77	.46	.82
6	66.7	4.0	64.7	6.0	.611	.72	.46	.82
7	67.0	4.3	64.8	6.5	.613	.73	.60	.81
8	68.5	6.8	65.1	10.2	.619	.75	2.65	.72
9	69.8	8.5	65.5	12.8	.628	.80	3.48	.66
10	70.3	10.5	65.0	15.8	.617	.65	4.42	.60
11	70.6	13.2	64.0	19.8	.597	.38	5.72	.53
Noon.	71.0	14.4	63.8	21.6	.593	.32	6.36	.50
1	71.4	15.0	63.9	22.5	.595	.33	.73	.49
2	71.6	15.4	63.9	23.1	.595	.33	.96	.48
3	71.7	15.8	63.8	23.7	.593	.29	7.20	.47
4	71.8	15 2	64.2	22.8	.601	.38	6.91	.48
5	71.5	13.9	64.5	20.9	.607	.48	.20	.51
6	71.6	10.8	66.2	16.2	.642	.89	4.72	.59
7	71 1	8.6	66.8	12.9	.655	7.07	3.65	.66
8	70.7	7.2	67.1	10.8	.661	.16	.00	.71
9	70.4	6.0	67.4	9.0	.668	.26	2.46	.75
10	70 0	5.5	67.2	8.3	.664	.23	.23	.76
11	69.6	4.9	67.1	7.4	.661	.22	1.96	.79

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches		
1	140.5	...	S.	Cloudless.
2	*Sunday.*			
3	134.0	...	N. & S. W.	Cloudless.
4	136.0	...	S. W.	Cloudless.
5	139.0	...	S. W. & S.	Cloudless till 9 A. M. Scatd. _i & ∩i till 7 P. M. cloudless afterwards.
6	122.4	...	S.	Cloudless till 7 A. M. Scatd. clouds till 7 P. M. cloudless afterwards; also slightly drizzling at 7 P. M.
7	135.0	...	S.	Scatd. _i & ∩i.
8	133.4	...	S.	Cloudless till 8 A. M. Scatd. _i & ∩i till 5 P. M. cloudless afterwards.
9	*Sunday.*	...		
10	130.0	0.11	S. & S. W.	Cloudless till 7 A. M. Scatd. _i & ∩i till 3 P. M. cloudy afterwards; also raining at 9 P. M.
11	131.0	...	N. & S. E. & S.	Cloudy till 9 A. M. Scatd. _i till 4 P. M. cloudless afterwards.
12	130.0	...	N. & W.	Scatd. ∩i & _i till 7 A. M. cloudless afterwards; also foggy at 10 & 11 P. M.
13	135.0	...	N. & N. E.	Cloudless.
14	136.0	...	E. & N. E. & N. W.	Cloudless till 7 P. M. Scatd. _i afterwards.
15	135.5	...	N. W. & N.	Scatd. _i till 8 P. M. cloudless afterwards.
16	*Sunday.*			
17	140.0	...	E. & W.	Cloudless till 1 P. M. cloudy afterwards.
18	136.0	...	W. &. S. W.	Scatd. _i till 4 A. M. cloudless till 10 A. M. Scatd. _i till 5 P. M. cloudless afterwards.
19	136.0	...	N. W. & N.	Cloudless till 7 A. M. Scatd. \i & _i till 6 P. M. cloudless afterwards.
20	136.0	...	S. W. & N.	Cloudless.
21	137.4	...	N.	Cloudless.
22	143.0	...	S. E. & N.	Cloudless till 1 P. M. Scatd. \i afterwards.
23	*Sunday.*			
24	139.4	...	S.	Cloudless till 8 A. M. Scatd. clouds till 8 P. M. cloudless afterwards.
25	135.0	...	S.	Cloudless till 5 A. M. Scatd. ∩i & _i till 1 P. M. cloudless afterwards.
26	135.0	...	S. & S. W.	Cloudless.
27	129.0	...	S. & S. W.	Scatd. ∩i & _i till 3 P. M. cloudy afterwards.

\i Cirri, _i Cirro strati, ∩i Cumuli, ~i Cumulo strati, _i Nimbi, —i Strati, ~i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
28	135.0	...	E. & S.	Cloudless till 1 P. M. Scatd. ⌒i & ⌣i till 6 P. M. cloudless afterwards.
29	135.0	1.58	E.	Cloudless till 9 A. M. cloudy afterwards; also rain with thunder and lightning from Noon to 9 P. M.
30	*Sunday.*	...		
31	126.0	...	S. & E. & S. E.	Cloudless.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March, 1862.

Monthly Results.

	Inches.
Mean height of the Barometer for the month, ...	29 900
Max. height of the Barometer occurred at 10 A. M. on the 14th, ..	30.115
Min. height of the Barometer occurred at 5 P. M. on the 1st, ..	29.660
Extreme range of the Barometer during the month, ...	0.455
Mean of the daily Max. Pressures, ...	29.980
Ditto ditto Min. ditto, ...	29.832
Mean daily range of the Barometer during the month, ...	0.148

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	o
Mean Dry Bulb Thermometer for the month, ...	78.4
Max. Temperature occurred at 3 P. M. on the 22nd, ...	94.6
Min. Temperature occurred at 6 A. M. & 8 P. M. on the 4th & 29th, ..	64.5
Extreme range of the Temperature during the month, ...	30.1
Mean of the daily Max. Temperature, ...	88.3
Ditto ditto Min. ditto, ...	70.3
Mean daily range of the Temperature during the month, ..	18.0

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	o
Mean Wet Bulb Thermometer for the month, ...	69.8
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer,..	8.6
Computed Mean Dew-point for the month, ...	6.55
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	12.9
	Inches
Mean Elastic force of Vapour for the month,..	0.628

	Troy grains.
Mean Weight of Vapour for the month, ...	6.80
Additional Weight of Vapour required for complete saturation, ..	3.51
Mean degree of humidity for the month, complete saturation being unity,	0.66

	Inches.
Rained 3 days, Max. fall of rain during 24 hours, ...	1.58
Total amount of rain during the month, ...	1.69
Prevailing direction of the Wind, ...	S. & N. & S.W.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March, 1862.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
	No. of days.																		
Midnight.	3				3		2		9		4		1						4
1	4				4		1		11		4		1						1
2	4		1		4		1		10		3		1		1				1
3	4		1		5				9		4				1				2
4	4		1		2				9		4		1		1				4
5	6		1		3				9		4		1		1				1
6	6		1		3				8		5		2		1				
7	6				5		1		6		5		3						
8	8				1		2		7		3		1						
9	9				2		2		4		6		2		1				4
10	7		1		3		2		5		7				1				
11	8		1		3		3		3		7		1						
Noon.	4				2	1	2		4		5		5		4				
1	5		3				1		5		6	1	1		5				
2	2		1		1		3		7		5		2		5				
3	3		1		1		2		6	1	6		3		4				
4	3		2				1		5	1	7		2		6				
5	3				2		2		10		3		2		3				1
6	3				2		3		9		3		3		3				
7	4				2		3	1	10	1	2		2		3				
8	2				4	1	2		12		2		2		2				
9	3	1			4	1	2		11		2		2		2				
10	3				4		2		11		2		2		2				
11	2				4		2		11		2		2		2				1

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1862.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11 Feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.809	29.888	29.707	0.181	79.9	88.8	70.9	17.9
2	.761	.842	.682	.160	83.4	92.6	77.2	15.4
3	.763	.831	.691	.140	82.6	90.8	76.4	14.4
4	.805	.873	.755	.118	82.1	91.0	75.0	16.0
5	.844	.911	.794	.117	84.0	92.8	77.6	15.2
6	*Sunday.*							
7	.786	.859	.702	.157	87.0	97.6	78.2	19.4
8	.783	.876	.699	.177	87.1	97.4	79.0	18.4
9	.792	.874	.725	.149	86.7	96.2	79.0	17.2
10	.810	.876	.740	.136	85.5	93.8	77.8	16.0
11	.838	.925	.776	.149	85.6	97.0	74.6	22.4
12	.875	.959	.819	.140	86.2	97.0	77.0	20.0
13	*Sunday.*							
14	.796	.878	.691	.187	87.8	100.2	77.2	23.0
15	.734	.812	.645	.167	88.7	99.8	79.2	20.6
16	.697	.778	.613	.165	88.3	99.5	80.2	19.3
17	.680	.748	.580	.168	86.8	95.8	81.6	14.2
18	.711	.766	.658	.108	86.2	95.2	79.8	15.4
19	.700	.765	.631	.134	85.4	92.4	79.8	12.6
20	*Sunday.*							
21	.786	.860	.715	.145	85.6	91.2	81.8	9.4
22	.812	.885	.739	.146	84.1	91.4	75.0	16.4
23	.784	.858	.707	.151	83.5	92.2	76.2	16.0
24	.726	.780	.619	.161	83.9	91.2	76.2	15.0
25	.668	.750	.561	.189	82.1	92.2	72.4	19.8
26	.616	.717	.536	.181	83.5	90.4	76.8	13.6
27	*Sunday.*							
28	.637	.697	.576	.121	82.6	89.2	75.8	13.4
29	.658	.714	.604	.110	81.2	89.6	70.7	18.9
30	.686	.771	.543	.228	80.3	89.6	72.5	17.1

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1862.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	74 4	5.5	71 6	8 3	0.766	8.27	2.51	0.77
2	77.5	5.9	74.5	8.9	.840	9.01	.95	.75
3	77.6	5.0	75.1	7.5	.857	.19	.49	.79
4	76.8	5.3	74.1	8.0	.830	8.92	.59	.78
5	78.3	5.7	75.4	8.6	.865	9.26	.91	.76
6	*Sunday.*							
7	76.6	10.4	71.4	15.6	.761	8.08	5.21	.61
8	76.5	10.6	71.2	15 9	.756	.03	.30	.60
9	74.8	11.9	68.8	17.9	.699	7.43	.75	.56
10	75.0	10 5	69.7	15.8	.720	.68	.04	.60
11	73.4	12.2	67.3	18.3	.666	.10	.66	.56
12	74.9	11.3	69.2	17.0	.708	.54	.45	.58
13	*Sunday.*							
14	76.5	11.3	70.8	17.0	.746	.92	.68	.58
15	77.2	11.5	71.4	17.3	.761	8.07	.89	.58
16	78.8	9.5	74.0	14 3	.827	.79	.01	.64
17	80.1	6.7	76.7	10.1	.902	9.60	3.61	.73
18	79.2	7.0	75.7	10.5	.873	.30	.69	.72
19	78.8	6.6	75.5	9.9	.868	.27	.41	.73
20	*Sunday.*							
21	79.0	6.6	75.7	9.9	.873	.32	.44	.73
22	78 3	5.8	75.4	8 7	.865	.26	2.95	.76
23	77.5	6.0	74.5	9 0	.840	.01	.99	.75
24	77.3	6.6	74.0	9.9	.827	8.86	3.27	.73
25	75.6	6 5	72.3	9.8	.783	.41	.10	.73
26	76.4	7.1	72.8	10.7	.795	.52	.48	.71
27	*Sunday.*							
28	77 7	4.9	75.2	7.4	.860	9.24	2.44	.79
29	76.2	5.0	73.7	7.5	.819	8.82	.39	.79
30	75.0	5.3	72.3	8.0	.783	.44	.47	.77

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.757	29.871	29.589	0.282	79.9	83.2	75.0	8.2
1	.746	.862	.584	.278	79.3	82 8	71.2	11.6
2	.738	.844	.576	.268	79.1	83.0	71 0	12.0
3	.732	.839	.587	.252	78.5	82.6	71.0	11.6
4	.729	.825	.608	.217	78.4	82.0	70.9	11.1
5	.748	.844	.625	.219	78.0	81.9	71.2	10.7
6	.767	.872	.636	.236	78.0	81.8	71.2	10.6
7	.786	.905	.643	.262	79.0	82.2	73.2	9.0
8	.807	.923	.656	.267	81.7	84.4	77.5	6.9
9	.823	.959	.690	.269	85.6	89.8	80.6	9.2
10	.820	.954	.667	.287	88.0	91.4	84.2	7.2
11	.809	.948	.666	.282	90.1	95.0	86.0	9.0
Noon.	.791	.929	.655	.274	91.5	96.8	87.0	9 8
1	.764	.901	.621	.280	92.6	98.6	87.8	10.8
2	.732	.881	.582	.299	93.2	99.8	88.2	11.6
3	.705	.853	.568	.285	93.1	100.2	87.8	12.4
4	.681	.830	.543	.287	92.4	100.2	85 8	14.4
5	.682	.821	.541	.280	90.2	98.4	78.6	19.8
6	.692	.830	.536	.294	87.6	94.8	74.0	20.8
7	.713	.844	.563	.281	85.4	91.6	71.0	20.6
8	.740	.866	.585	.281	83.2	87.6	70.7	16.9
9	.756	.884	.586	.298	82.0	87.3	72.6	14.7
10	.759	.892	.556	.336	81.0	85.0	72 5	12.5
11	.757	.888	.611	.277	80.5	84.5	73.0	11.5

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	76.0	3.9	74.0	5.9	0.827	8.93	1.85	0.83
1	75.6	3.7	73.7	5.6	.819	.85	.74	.84
2	75.4	3.7	73 5	5.6	.814	.79	.74	.84
3	75.1	3 4	73.4	5.1	.811	.78	.57	.85
4	75.1	3.3	73.4	5.0	.811	.78	.53	.85
5	74.8	3.2	73.2	4.8	.806	.73	.46	.86
6	74.8	3.2	73.2	4.8	.806	.73	.46	.86
7	75.6	3.4	73.9	5.1	.824	.92	.58	.85
8	77.0	4.7	74.6	7.1	.843	9.07	2.30	.80
9	78.0	7 6	74.2	11.4	.832	8.89	3 87	.70
10	78.1	9.9	73.1	14.9	.803	.53	5.15	.62
11	78.4	11.7	72.5	17.6	.787	.32	6.22	.57
Noon.	78.4	13.1	71 8	19.7	.771	.11	7.01	.54
1	78.6	14.0	71 6	21.0	.766	.05	.58	.52
2	78.7	14.5	71.4	21.8	.761	7.98	.92	.50
3	78.6	14 5	71 3	21.8	.758	.96	.90	.50
4	78.4	14.0	71.4	21.0	.761	8.00	.54	.52
5	78.4	11.8	72.5	17.7	.787	.32	6.27	.57
6	78.0	9.6	73 2	14.4	.806	.57	4.95	.63
7	77.6	7.8	73.7	11.7	.819	.71	3.94	.69
8	76.5	6.7	73.1	10.1	.803	.61	.28	.72
9	76.3	5.7	73.4	8.6	.811	.71	2.76	.76
10	75.9	5.1	73.3	7.7	.809	.70	.44	.78
11	75.7	4.8	73.3	7.2	.809	.72	.26	.79

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	128 0	...	S.	Scatd. clouds till 3 P. M. cloudless afterwards.
2	132.0	...	S.	Cloudless till 7 A. M. Scatd. ⌣i till 3 P. M. cloudless afterwards.
3	127.0	...	S.	Cloudless till 5 A. M. Scatd. ⌣i till 3 P. M. cloudy afterwards; also drizzling at 6 & 10 P. M.
4	121.8	...	S.	Cloudless till 6 P. M. Scatd. ∩i & ⌣i afterwards.
5	128.0	...	S.	Scatd. clouds till 6 P. M. cloudless afterwards.
6			*Sunday.*	
7	132.0	...	S. W.	Cloudless till 5 A M. Scatd. \i till Noon, cloudless afterwards.
8	133.4	...	S. W. & W.	Cloudless till 5 A. M. Scatd. ⌣i till 11 A. M. cloudless afterwards.
9	131.0	...	S. W. & S. & W.	Cloudless till 5 A. M. Scatd. \i & ∩i till 6 P. M. cloudless afterwards.
10	127.0	...	W. & S.	Scatd. \i & ⌣i till till 7 A. M. cloudless 11 A. M. Scatd. ⌣i afterwards.
11	140.0	...	S. & S. W.	Cloudless.
12	137.4	..	S & S. W.	Cloudless.
13			*Sunday.*	
14	140.0	...	S. & S. W.	Cloudless.
15	138.0	...	S. & W.	Cloudless.
16	137.0	...	S.	Cloudless.
17	134.4	...	S.	Scatd. ⌣i & ∩i.
18	131.8	...	S. & S. W.	Cloudless.
19	137.0	...	S.	Scattered clouds till 3 P. M. cloudless afterwards.
20			*Sunday.*	
21	128.0	...	S.	Scattered clouds till 6 P. M. cloudless afterwards.
22	118.0	0.11	S. & S. E.	Scatd. ⌣i & ∩i till 2 P. M. cloudy afterwards; also raining between 9 & 10 P. M.
23	125.4	...	S. & S. E.	Cloudless till 8 A. M. Scatd. ∩i till 2 P. M. cloudy afterwards.
24	133.0	0.12	S.	Scatd. ⌣i 3 P. M. cloudy afterwards; also thunder, & lightning & a little rain between 8 & 9 P. M.

\i Cirri, ⌣i Cirro strati, ∩i Cumuli, ∩i Cumulo strati, ⌣i Nimbi, —i Strati, \i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1861.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
25	127.8	0.38	S. & E.	Cloudless till 5 A. M. Scatd. ⌣i & ⌒i till 6 P. M. cloudy afterwards; also thundering & lightning & raining between 10 & 11 P. M.
26	121.0	...	S. & S. E.	Cloudy till 2 A. M. cloudless till 8 A. M. Scattered ⌒i & ⌣i till 2 P. M. cloudy afterwards.
27		0.60	*Sunday.*	
28	115.0		S. & Calm.	Cloudless till 3 A. M. cloudy till 11 A. M. Scatd. ⌣i & ⌒i afterwards; also slightly drizzling at Noon & 10 P. M.
29	126.0	0.68	S. & N. & E.	Cloudless till 5 A. M. cloudy afterwards, also raining between 5 & 9 P. M.
30		0.64	S. & S. E.	Cloudy till Noon, Scatd. ⌣i till 6 P. M. cloudy afterwards; also thunder & lightning, accompanied with rain between 8 & 9 P. M.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1862.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ...	29.752
Max. height of the Barometer occurred at 9 A. M. on the 12th, ..	29.959
Min. height of the Barometer occurred at 6 P. M. on the 26th, ..	29.536
Extreme range of the Barometer during the month, ...	0.423
Mean of the Daily Max. Pressures, ...	29.827
Ditto ditto Min. ditto, ...	29.673
Mean daily range of the Barometer during the month, ...	0.154

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	o
Mean Dry Bulb Thermometer for the month, ...	84.6
Max. Temperature occurred at 3 & 4 P. M. on the 14th, ...	100.2
Min. Temperature occurred at 8 P. M. on the 29th, ...	70.7
Extreme range of the Temperature during the month, ...	29.5
Mean of the daily Max. Temperature, ...	93.7
Ditto ditto Min. ditto, ...	76.8
Mean daily range of the Temperature during the month, ...	16.9
Mean Wet Bulb Thermometer for the month, ...	76.9
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	7.7
Computed Mean Dew-point for the month, ...	73.0
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	11.6

	Inches
Mean Elastic force of Vapour for the month, ...	0.801

	Troy grains
Mean Weight of Vapour for the month, ...	8.55
Additional Weight of Vapour required for complete saturation, ..	3.84
Mean degree of humidity for the month, complete saturation being unity,	0.69

	Inches
Rained 8 days, Max. fall of rain during 24 hours, ...	0.68
Total amount of rain during the month, ...	2.53
Prevailing direction of the Wind, ...	S. & S. W.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April, 1862.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.	1						2		12		3		1				2		5
1	1				1		2		14		4		1				2		1
2	1				1		3		15		4		1				1		
3					1		2		14		3		3				1		2
4					1		2		13		3		2				1		4
5					3		1		15		3		3				1		
6					2		1		15		5		2		1				
7					2		1		16		4		2		1				
8					1		2		18		3		1						1
9							1		19		4		2						
10							1		17		6		2						
11									17		6		2		1				
Noon.	1								17	1	6		2						
1							1		16		6		2		1				
2							2		16		4		4						
3							1		14		6		4						1
4							1		16		4		3		1				1
5	1	1			1				18		3		3						
6	1	1					1		17	1	4		3						
7	1	1					1		18		3		3						
8	1	1					2	1	20	1	1		2						
9	2	1			1		3	1	17	1	2				1				
10	1				1		3	1	17	2	1				2	1			1
11	1				1	1	3		18		2				1				

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.647	29.740	29.556	0.184	80.7	88.5	72.6	15.9
2	.665	.730	.607	.123	84.7	93.2	78.4	14.8
3	.692	.767	.629	.138	83.1	90.4	73.0	17.4
4	*Sunday.*							
5	.776	.851	.704	.147	83.4	91.8	74.0	17.8
6	.822	.919	.750	.169	77.0	83.2	72.2	11.0
7	.764	.828	.697	.131	82.2	90.5	74.4	16.1
8	.791	.873	.724	.149	81.8	88.4	75.0	13.4
9	.791	.875	.719	.156	85.0	93.5	78.6	14.9
10	.775	.834	.710	.124	84.5	91.4	79.6	11.8
11	*Sunday.*							
12	.666	.740	.572	.168	83.3	92.4	74.8	17.6
13	.654	.722	.574	.148	86.1	94.2	79.7	14.5
14	.705	.766	.643	.123	86.0	93.5	78.8	14.7
15	.690	.738	.649	.089	82.8	92.8	78.8	14.0
16	.668	.732	.575	.157	86.0	95.4	78.9	16.5
17	.640	.699	.564	.135	86.6	95.8	79.0	16.8
18	*Sunday.*							
19	.692	.746	.622	.124	86.0	94.8	78.5	16.3
20	.685	.747	.608	.139	83.2	94.2	75.6	18.6
21	.686	.770	.626	.144	82.4	89.2	76.2	13.0
22	.672	.752	.611	.141	85.8	95.4	77.4	18.0
23	.736	.809	.669	.140	87.7	94.4	82.2	12.2
24	.749	.811	.675	.136	87.4	93.4	82.4	11.0
25	*Sunday.*							
26	.638	.694	.574	.120	87.8	99.9	80.0	19.9
27	.608	.684	.531	.153	89.5	101.8	81.0	20.8
28	.567	.628	.483	.145	91.5	103 2	83.5	19.7
29	.558	.629	.474	.155	91 6	102.8	84.6	18.2
30	.565	.650	.496	.154	90.1	99.8	84.6	15.2
31	.582	.630	.533	.097	90.2	97.8	84.8	13.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	75.5	5.2	72.9	7 8	0.797	8.59	2.45	0.78
2	78.4	6.3	75.2	9.5	.860	9.18	3.24	.74
3	77.6	5.5	74.8	8.3	.849	.11	2.75	.77
4	*Sunday.*							
5	78.3	5.1	75.7	7.7	.873	.36	.60	.78
6	73.3	3.7	71.4	5.6	.761	8.25	1.64	.83
7	76.8	5.4	74.1	8.1	.830	.92	2.62	.77
8	75.3	6.5	72.0	9.8	.776	.33	3.07	.73
9	78.2	6.8	74.8	10.2	.849	9.07	.46	.72
10	78.4	6.1	75.3	9.2	.862	.23	.12	.75
11	*Sunday.*							
12	76.4	6.9	72.9	10.4	.797	8.56	.37	.72
13	79.1	7.6	75.6	10.5	.871	9.27	.68	.72
14	79.7	6.3	76.5	9.5	.896	.56	.35	.74
15	77.6	5.2	75.0	7.8	.854	.16	2.59	.78
16	79.6	6.4	76.4	9.6	.893	.53	3.38	.74
17	79.8	6.8	76.4	10.2	.893	.53	.61	.73
18	*Sunday.*							
19	79.4	6.6	76 1	9.9	.885	.44	.47	.73
20	77.6	5.6	71.8	8.4	.849	.11	2.78	.77
21	76.2	6.2	73.1	9.3	.803	8.63	.98	.74
22	79.3	6.5	76.0	9.8	.882	9.41	3.42	.73
23	81.4	6.3	78.2	9.5	.946	10.05	.51	.74
24	81.4	6.0	78.4	9.0	.952	.12	.33	.75
25	*Sunday.*							
26	80.6	7.2	77.0	10.8	.910	9.67	.93	.71
27	81.1	8.4	76.9	12.6	.908	.60	4.69	.67
28	82.5	9.0	78.0	13.5	.940	.90	5.25	.65
29	83.4	8 2	79.3	12 3	.979	10 34	4.85	.68
30	83.0	7.1	79.4	10.7	.983	.39	.15	.72
31	83.7	6.5	80.4	9.8	1.014	.72	3.87	.74

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.686	29.815	29.550	0.265	81.0	86.8	73.3	13.5
1	.680	.806	.543	.263	80.5	86.4	74.4	12.0
2	.669	.803	.531	.272	80.3	86.2	74.0	12.2
3	.659	.800	.519	.281	80.2	86.0	73.2	12.8
4	.667	.820	.520	.300	79.5	85.3	72.3	13.0
5	.674	.766	.558	.208	79.6	84.8	73.6	11.2
6	.696	.845	.582	.263	79.6	84.8	72.4	12.4
7	.717	.876	.591	.285	80.8	86.6	72.2	14.4
8	.745	.910	.614	.296	83.2	90.0	72.6	17.4
9	.746	.897	.620	.277	86.3	91.6	73.0	18.6
10	.748	.919	.620	.299	88.5	94.6	76.0	18.6
11	.734	.899	.595	.304	90.6	97.6	75.6	22.0
Noon.	.718	.841	.580	.261	91.7	100.2	76.8	23.4
1	.695	.835	.555	.280	92.8	102.0	80.8	21.2
2	.665	.820	.532	.288	93.0	102.7	83.2	19.5
3	.642	.798	.511	.287	93.2	103.2	82.6	20.6
4	.624	.774	.485	.289	92.1	103.0	82.4	20.6
5	.620	.761	.474	.287	90.2	99.8	81.9	17.9
6	.626	.750	.490	.260	88.1	96.7	80.0	16.7
7	.649	.761	.512	.249	85.4	92.6	79.2	13.4
8	.672	.801	.526	.275	84.1	90.0	76.2	13.8
9	.686	.794	.555	.239	83.1	89.0	74.4	14.6
10	.704	.851	.567	.284	82.4	87.6	74.0	13.6
11	.701	.815	.571	.244	81.7	87.0	73.0	14.0

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Midnight.	77.1	3.9	75.1	5.9	0.857	9.23	1.91	0.83
1	76.7	3.8	74.8	5.7	.849	.15	.83	.83
2	76.6	3.7	74.7	5.6	.846	.12	.79	.84
3	76.8	3.4	75.1	5.1	.857	.25	.63	.85
4	76.5	3.0	75.0	4.5	.854	.22	.44	.87
5	76.9	2.7	75.5	4.1	.868	.38	.31	.88
6	77.0	2.6	75.7	3.9	.873	.43	.26	.88
7	77.7	3.1	76.1	4.7	.885	.53	.54	.86
8	79.1	4.1	77.0	6.2	.910	.77	2.12	.82
9	80.4	5.9	77.4	8.9	.922	.83	3.19	.76
10	80.9	7.6	77.1	11.4	.913	.70	4.18	.70
11	81.3	9.3	76.6	14.0	.899	.50	5.26	.64
Noon.	81.6	10.1	76.5	15.2	.896	.46	.77	.62
1	81.7	11.1	76.1	16.7	.885	.30	6.42	.59
2	81.3	11.7	75.4	17.6	.865	.09	.72	.58
3	81.4	11.8	75.5	17.7	.868	.12	.78	.57
4	80.6	11.5	74.8	17.3	.849	8.95	.46	.58
5	80.4	9.8	75.5	14.7	.868	9.18	5.41	.63
6	80.0	8.1	75.9	12.2	.879	.34	4.38	.68
7	79.4	6.0	76.4	9.0	.893	.55	3.13	.75
8	78.6	5.5	75.8	8.3	.876	.39	2.82	.77
9	78.0	5.1	75.4	7.7	.865	.28	.58	.78
10	78 0	4.4	75.8	6.6	.876	.41	.20	.81
11	77.8	3.9	75.8	5.9	.876	.43	1.94	.83

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches		
1	116.6	...	S.	Cloudy till 9 A. M. Scatd. _i & ∩i. till 6 P. M. cloudy afterwards; also slightly drizzling at 5 A. M. & between 8 & 9 P. M.
2	127.0	...	S. & S. E.	Cloudless till 7 A. M. Scatd. clouds till 7 P. M. cloudless afterwards.
3	131.3	0.56	S. & S. W.	Cloudless till 4 A. M. Scatd. ∩i & _i till 6 P. M. cloudy afterwards; also raining between 9 & 11 P. M.
4	*Sunday.*			
5	130.0	0.96	S. & S. E.	Cloudless till 6 A. M. Scatd. _i till 6 P. M. cloudy afterwards; also raining at 10 P. M.
6	...	1.26	S. & N. W.	Cloudy till 5 P. M. Scatd. _i afterwards; also raining at 3 & 4 & between 6 & 7 A. M.
7	132.5	...	S. & S. E.	Cloudless till 7 A. M. Scatd. ∩i till 6 P. M. cloudless afterwards.
8	130.7	...	S.	Scated clouds.
9	135.0	...	S. & S. W.	Cloudless till 5 A. M. Scatd. _i & ∩i afterwards; also slightly drizzling between 6 & 7 P. M.
10	123.5	...	S.	Cloudless till 10 A. M. Scatd. ∩i & _i afterwards.
11	*Sunday.*	0.60		
12	135.5	...	S. E. & S. & S. W.	Cloudless till 8 A. M. Scatd. ∩i till 5 P. M. cloudless afterwards.
13	136.5	...	S.	Cloudless till 10 A. M. Scatd. ∩i till 6 P. M.; cloudy afterwards.
14	127.0	...	S. & S. E.	Cloudless till 8 A. M. Scatd. ∩i & _i afterwards.
15	...	0.12	E. & S. E.	Cloudless till 5 A. M. cloudy afterwards; also thunder & lightning between 8 & 11 P. M. & raining at Noon, 2 & 9 P. M.
16	134.0	...	S. & S. E.	Scatd. _i & ∩i.
17	133.0	...	S. & E.	Cloudless till 8 A. M. Scatd. _i & ∩i till 7 P. M. cloudless afterwards.
18	*Sunday.*			
19	130.5	...	S. E. & S.	Scatd. _i till 8 A. M. Scatd. ∩i till 6 P. M. cloudy afterwards; also slightly drizzling between 7 & 8 P. M.

\i Cirri, _i Cirro strati, ∩i Cumuli, ∩i Cumulo strati, _i Nimbi, —i Strati, \i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
20	135.0	...	E. & S.	Cloudless till 6 A. M. Scatd. ⌣i & ∩i till 3 P. M. cloudy afterwards; also very slightly raining between 8 & 9 P. M.
21	126.4	...	E. & N. E.	Cloudy till 7 A. M. Scatd. ⌒i till 2 P. M. cloudless afterwards.
22	136.0	...	S. & S. W.	Cloudy till 5 A. M. Scatd. ∩i till 5 P. M. cloudless afterwards.
23	133.0	...	S. W.	Cloudless till 5 A. M. Scatd. ∩i & ⌣i afterwards.
24	128.5		S. & E.	Cloudless till 5 A. M. Scatd. ⌣i & ∩i till 3 P. M. cloudless afterwards.
25	*Sunday.*			
26	139.0	0.22	S.	Cloudless till Noon, cloudy till 8 P. M. cloudless afterwards; also raining between 6 & 7 P. M.
27	139.0	...	S. & E.	Cloudless.
28	139.3	...	S.	Cloudless.
29	142.0	...	S. & calm.	Cloudless till Noon, Scatd. ⌣i & ∩i till 7 P. M. cloudless afterwards.
30	139.0	0.08	S. & S. E.	Cloudless till 2 P. M. Scatd. clouds till 7 P. M. cloudless afterwards; also raining between 4 & 5 P. M.
31	130.0	...	S & S. W.	Cloudless till 4 A. M. Scatd. ⌣i till 4 P. M. cloudy afterwards.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

MONTHLY RESULTS.

	Inches
Mean height of the Barometer for the month, ...	29.684
Max. height of the Barometer occurred at 10 A. M. on the 6th, ..	29.919
Min. height of the Barometer occurred at 5 P. M. on the 29th, ..	29.474
Extreme range of the Barometer during the month, ...	0.445
Mean of the daily Max. Pressures, ...	29.754
Ditto ditto Min. ditto, ...	29.614
Mean daily range of the Barometer during the month, ...	0.140

	o
Mean Dry Bulb Thermometer for the month, ...	85.4
Max. Temperature occurred at 3 P. M. on the 28th, ...	103.2
Min. Temperature occurred at 7 A. M. on the 6th, ...	72.2
Extreme range of the Temperature during the month, ...	31 0
Mean of the daily Max. Temperature, ...	94.1
Ditto ditto Min. ditto, ...	78.5
Mean daily range of the Temperature during the month, ..	15.6

	o
Mean Wet Bulb Thermometer for the month, ...	79.0
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	6.4
Computed Mean Dew-point for the month, ...	75.8
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	9.6
	Inches
Mean Elastic force of Vapour for the month, ...	0.876

	Troy grains.
Mean Weight of Vapour for the month, ...	9.35
Additional Weight of Vapour required for complete saturation, ..	3.33
Mean degree of humidity for the month, complete saturation being unity,	0.74

	Inches
Rained 11 days, Max. fall of rain during 24 hours, ...	1.26
Total amount of rain during the month, ...	3.80
Prevailing direction of the Wind, ...	S.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May, 1862.

MONTHLY RESULTS.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.			1		5		4		11		2				1				3
1			1		5		4		13		1		1		1		1		
2			1		5		6		11		1		1		1		1		
3			1		6		6		11						1	1	1		1
4			1		5		7		9						1	1			4
5	1		2		6	1	6		10								1		1
6	1		4		5		5		10						1		1		
7	1		3		4		7		11						1	1			
8					5		7		10		1								4
9					4		3		20										
10					3		3		18		3								
11					2		2		19		3				1				
Noon.	1				2	1	3		14		6				1				
1	1						3		13		7		2		1				
2			2	1			1		12		6		3		3				
3			1		1				16		7				2				
4	1				3		3		10		8		1		1				
5					2		3		14	1	4		1						3
6					4		3		14		5								1
7					5		2		17	2	2								1
8					5	1	2		15		2				1				2
9					4	2	1		15	1	3				1	1			3
10					3		2	1	15		4				1	1	1		1
11					3		2		15		4				1	1	1		1

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	*Sunday.*							
2	29.638	29.731	29.542	0.189	86.1	95.0	77.6	17.4
3	.641	.709	.565	.144	84.4	92.6	77.4	15.2
4	.549	.610	.425	.185	88.2	96.0	81.0	15.0
5	.510	.567	.420	.147	85.6	93.2	75.6	17.6
6	.568	.635	.461	.174	84.1	90.8	77.2	13.6
7	.625	.687	.551	.136	85.7	91.6	80.2	11.4
8	*Sunday.*							
9	.658	.733	.572	.161	84.7	91.6	78.3	13.3
10	.563	.628	.465	.163	88.6	96.2	81.2	15.0
11	.559	.612	.504	.108	87.2	95.4	82.2	13.2
12	.604	.652	.524	.128	81.4	83.2	77.4	5.8
13	.632	.699	.563	.136	82.5	90.3	78 0	12.3
14	.625	.686	.549	.137	83.3	90.2	77.0	13.2
15	*Sunday.*							
16	.511	.566	.439	.127	82.7	89.2	79.8	9.4
17	.444	.482	.390	.092	81.2	83.8	79.2	4.6
18	.504	.604	.435	.169	80.1	83.4	75.6	7.8
19	.602	.645	.561	.084	80.8	85.8	75.2	10.6
20	.624	.682	.564	.118	85.3	91.7	80.6	11.1
21	.594	.647	.542	.105	85.5	90.8	81.8	9.0
22	*Sunday.*							
23	.519	.587	.444	.143	86.5	92.0	82.7	9.3
24	.541	.587	.466	.121	86.5	91.4	83.0	8.4
25	.511	.582	.421	.161	84.1	90.6	76.4	14.2
26	.438	.494	.389	.105	85.8	90.6	80.4	10.2
27	.416	.469	.369	.100	85.2	91.9	81.0	10.9
28	.402	.461	.322	.139	86.1	92.4	82.0	10.4
29	*Sunday.*							
30	.465	.579	.391	.188	81.6	83.8	80.4	3.4

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the twenty-four hourly Observations made during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	°	°	°	°	Inches.	T. gr.	T. gr.	
1	*Sunday.*							
2	80.0	6.1	76.9	9.2	0.908	9.68	3.27	0.75
3	80.1	4.3	77.9	6.5	.937	10.02	2.29	.81
4	81.9	6.3	78.7	9.5	.961	.20	3.56	.74
5	80.6	5.0	78.1	7.5	.943	.06	2.79	.79
6	79.0	5.1	76.4	7.7	.893	9.56	.65	.78
7	79.9	5.8	77.0	8.7	.910	.71	3.09	.76
8	*Sunday.*							
9	78.4	6.3	75.2	9.5	.860	.18	.24	.74
10	80.6	8.0	76.6	12.0	.899	.54	4.38	.69
11	80.9	6.3	77.7	9.5	.931	.90	3.47	.74
12	78.5	2.9	77.0	4.4	.910	.81	1.46	.87
13	78.9	3.6	77.1	5.4	.913	.82	.82	.84
14	79.1	4.2	77.0	6.3	.910	.77	2.16	.82
15	*Sunday.*							
16	79.4	3.3	77.7	5.0	.931	10.00	1.72	.85
17	78.8	2.4	77.6	3.6	.928	9.99	.22	.89
18	77.7	2.4	76.5	3.6	.896	.67	.17	.89
19	78.5	2.3	77.3	3.5	.919	.90	.17	.89
20	80.9	4.4	78.7	6.6	.961	10.26	2.38	.81
21	81.2	4.3	79.0	6.5	.970	.35	.37	.81
22	*Sunday.*							
23	82.4	4.1	80.3	6.2	1.011	.78	.32	.82
24	82.4	4.1	80.3	6.2	.011	.78	.32	.82
25	80.0	4.1	77.9	6.2	0.937	.04	.17	.82
26	80.8	5.0	78.3	7.5	.949	.12	.71	.79
27	81.2	4.0	79.2	6.0	.976	.43	.18	.83
28	81.7	4.4	79.5	6.6	.986	.51	.44	.81
29	*Sunday.*							
30	79.2	2.4	78.0	3.6	.940	.11	1.23	.89

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.563	29.704	29.407	0.297	81.9	85.4	76.6	8.8
1	.555	.681	.405	.276	81.7	84.8	76.7	8.1
2	.543	.677	.403	.274	81.2	84.2	76.4	7.8
3	.534	.675	.398	.277	81.0	83.8	77.7	6.1
4	.534	.667	.389	.278	80.5	83.0	75.2	7.8
5	.545	.674	.394	.280	80.2	83.2	75.4	7.8
6	.563	.705	.410	.295	80.4	83.6	75.6	8.0
7	.577	.714	.419	.295	81.3	84.6	76.4	8.2
8	.588	.728	.442	.286	83.4	87.8	77.0	10.8
9	.597	.733	.453	.280	85.2	89.0	81.6	7.4
10	.595	.720	.453	.267	86.5	91.4	81.2	10.2
11	.585	.707	.444	.263	88.0	93.4	77.4	16.0
Noon.	.570	.682	.420	.262	88.5	95.5	77.8	17.7
1	.549	.664	.386	.278	89.3	96.0	79.2	16.8
2	.527	.634	.365	.269	89.7	95.8	80.4	15.4
3	.507	.609	.338	.271	89.0	95.8	81.3	14.5
4	.488	.585	.325	.260	88.6	96.2	81.0	15.2
5	.491	.583	.322	.261	87.3	96.0	79 2	16.8
6	.504	.591	.341	.250	86.5	94.4	80.6	13.8
7	.525	.644	.366	.278	85.3	92.4	80.0	12.4
8	.548	.660	.386	.274	84.0	90.4	77.9	12.5
9	.563	.677	.402	.275	83.0	88.2	75.6	12.6
10	.576	.717	.404	.313	82.4	86.8	75.6	11.2
11	.573	.731	·391	.340	82.2	86.4	76.2	10.2

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers, are derived from the Observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid-night.	79.2	2.7	77.8	4.1	0.934	10.05	1.39	0.88
1	79.2	2.5	77.9	3.8	.937	.08	.29	.89
2	78.8	2.4	77.6	3.6	.928	9.99	.22	.89
3	78.6	2.4	77.4	3.6	.922	.93	.21	.89
4	78.3	2.2	77.2	3 3	.916	.89	.09	.90
5	78.1	2.1	77.0	3.2	.910	.83	.05	.90
6	78.1	2.3	76.9	3.5	.908	.78	.16	.89
7	78.6	2.7	77.2	4.1	.916	.87	.37	.88
8	79.6	3.8	77.7	5.7	.931	.98	.98	.83
9	80.4	4.8	78.0	7.2	.940	10.05	2.56	.80
10	80.9	5.6	78.1	8.4	.943	.06	3.04	.77
11	81.5	6.5	78.2	9.8	.946	.05	.63	.74
Noon.	81.6	6.9	78.1	10.4	.943	.02	.86	.72
1	82.2	7.1	78.6	10.7	.958	.15	4.06	.71
2	82.4	7.3	78.7	11.0	.961	.18	.19	.71
3	82.0	7.0	78.5	10.5	.955	.12	3.96	.72
4	81.6	7.0	78.1	10.5	.943	.00	.92	.72
5	81.4	5.9	78.4	8.9	.952	.12	.29	.76
6	81.1	5.4	78.4	8.1	.952	.15	2.95	.78
7	80.6	4.7	78.2	7.1	.946	.11	.53	.80
8	79.8	4.2	77.7	6.3	.931	9.98	.19	.82
9	79.4	3.6	77.6	5.4	.928	.97	1.85	.84
10	79.1	3.3	77.4	5.0	.922	.91	.70	.85
11	78.9	3.3	77.2	5.0	.916	.85	.69	.85

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches		
1	...	0.54	*Sunday.*	
2	128.0	0.09	S. & S. E. & N.	Cloudy : also raining between 3 & 4 A. M. and incessantly raining between 7 & 11 P. M.
3	131.0	2.44	S. & S. W. & E.	Cloudy till 8 A. M. Scatd. ⌐i & ∩i till 5 P. M. cloudless afterwards also raining between Midnight & 2 A. M.
4	131.0	0.17	S. & S. W.	Cloudy till 8 A. M. cloudless till 4 P. M. cloudy afterwards : also raining with thunder and lightning between 8 & 9 P. M.
5	128.0	0.08	S. & S. E.	Cloudy till 7 A. M. Scatd. ∩i & ⌐i till 6 P. M. cloudy afterwards : also drizzling at 8, 9 & 11 P. M. also thunders and lightning between 9 & 10 P. M.
6	125.0	0.28	S. E. & E.	Cloudy till 7 A. M. Scatd. clouds afterwards : also raining at Midnight & 1 A. M.
7	119.0	...	N. E. & S.	Scatd. clouds till 11 A. M. cloudy afterwards, also slightly drizzling at 6 P. M.
8	...	...	*Sunday.*	
9	122.5	...	S. E. & Calm.	Cloudless till 7 A. M. Scatd. clouds till 6 P. M. cloudless afterwards ; also slightly drizzling at 1 P. M.
10	136.5	...	N. W. & Calm.	Cloudless till 8 A. M. Scatd. ∩i till 4 P. M. cloudless afterwards.
11	132.8	...	S. E. & S.	Cloudless till 6 A. M. Scatd. ⌐i & ∩i till 8 P. M. cloudless afterwards.
12	...	0.48	N. E. & S.	Cloudless till 4 A. M. cloudy afterwards ; also raining at 11 A. M. & Noon.
13	119.0	0.18	S. & S. E.	Scatd. clouds : also thunder and rain at 3 P. M.
14	...	...	S. & S. E.	Cloudy ; also slightly drizzling at 4 & 5 A M.
15	...	0.97	*Sunday.*	
16	120.0	...	S. E. & N. & W.	Cloudy ; also slightly drizzling at 11 P. M.
17	...	0.64	W. & S.	Cloudy ; also constantly drizzling.
18	...	0.27	S.	Cloudy ; also constantly drizzling.
19	...	4.36	S. & S. W.	Cloudy ; also raining between Midnight & 4 A. M. & between 11 A. M. & Noon.
20	129.3	...	S.	Scatd. ⌐i till 2 P. M. cloudy afterwards.

⌐i Cirri, ⌐—i Cirro strati, ∩i Cumuli, ∩—i Cumulo strati, ⌐—i Nimbi, —i Strati, ⌐∩i Cirro cumuli.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
21	119.0	...	S.	Cloudless till 4 A. M. Scatd. ⌣i & ⌢i till 9 P. M. cloudless afterwards.
22	...	...	*Sunday.*	
23	121.6	...	S.	Cloudless till 5 A. M. cloudy till 9 A. M. Scatd. clouds afterwards.
24	...	...	S.	Cloudy, the whole day.
25	128.7	1.68	S. & S. E.	Cloudy : also thundering and lightning between 1 & 5 A. M. and also raining between 1 & 8 A. M.
26	...	...	S.	Scatd. clouds till 7 P. M cloudless afterwards.
27	121.4	0.08	S. & Calm.	Cloudless till 7 A. M. Scatd. clouds afterwards : also drizzling at 3 & 4 P. M.
28	120.5	0.15	N. E. & Calm.	Scatd. clouds also raining between 4 & 5 P. M.
29	...	0.26	*Sunday.*	
30	...	0.96	S. E. & E.	Cloudy with rain at 9 & 10 A. M. and Noon, also drizzling between 5 & 6 P. M.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Monthly Results.

	Inches
Mean height of the Barometer for the month, ...	29.550
Max. height of the Barometer occurred at 9 A. M. on the 9th, ..	29.733
Min. height of the Barometer occurred at 5 P. M. on the 28th, ..	29.322
Extreme range of the Barometer during the month, ...	0.411
Mean of the daily Max. Pressures, ...	29.613
Ditto ditto Min. ditto, ...	29.475
Mean daily range of the Barometer during the month, ...	0.138

	o
Mean Dry Bulb Thermometer for the month, ...	84.5
Max. Temperature occurred at 4 P. M. on the 10th, ...	96.2
Min. Temperature occurred at 4 A. M. on the 19th, ...	75.2
Extreme range of the Temperature during the month, ...	21 0
Mean of the daily Max. Temperature, ...	90.5
Ditto ditto Min. ditto, ...	79.2
Mean daily range of the Temperature during the month, ..	11.3

	o
Mean Wet Bulb Thermometer for the month, ...	80.1
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	4.4
Computed Mean Dew-point for the month, ...	77.9
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	6.6
	Inches
Mean Elastic force of Vapour for the month, ...	0.937

	Troy grains
Mean Weight of Vapour for the month, ...	10.02
Additional Weight of Vapour required for complete saturation, ..	2.33
Mean degree of humidity for the month, complete saturation being unity,	0.81

	Inches
Rained 21 days, Max. fall of rain during 24 hours, ...	4.36
Total amount of rain during the month, ...	13.63
Prevailing direction of the Wind, ...	S. & S. E.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June, 1862.

Monthly Results.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. E.	Rain on.	E.	Rain on.	S. E.	Rain on.	S.	Rain on.	S. W.	Rain on.	W.	Rain on.	N. W.	Rain on.	Calm.	Rain on.	Missed.
					No. of days.														
Midnight.			3		1	1	1		13	1			2	1			4		1
1			3		1	1	2		11	1			2	1			4		2
2			2		2	2	2		12	1			2				4		1
3			2		1		3		11	2	2		2				2		2
4	1		1		2		4	1	9	1	2	1	1				1		4
5	1		1		1		5		12	2	2	1	1	1	1		1		
6	1		2		2		4		11	1	2		1		1		1		
7	2		2		3		3		11	1	2		2						
8	2		2		2		3		7	1	3				1			5	
9	1		3		1		3	1	11		3		1		1		1		
10	2		3				3	1	11		2		2		1		1		
11			3	1	3		1		11		2		2	1	3				
Noon.	1		4	1	2	1	1		13	2	1		2		1				
1	1		3		3	1	2		12		2				2				
2	1		6				5		9		3		1						
3			5		1		3	1	9		4		1	1	1		1	1	
4	2		1		3		3		8		4		1		1		2	2	
5	2				2		5		11	1	2						3	2	
6	1				3		6	2	12	1	2						1		
7	3	1	1		1		7		10	1	2						1		
8	3	2			1		6	1	9	2	2						4		
9	2	1					6	1	11	2	2	1					4		
10	2	1					7		11	2	1						4		
11	2	2			1		6	1	10	2	1						4		1